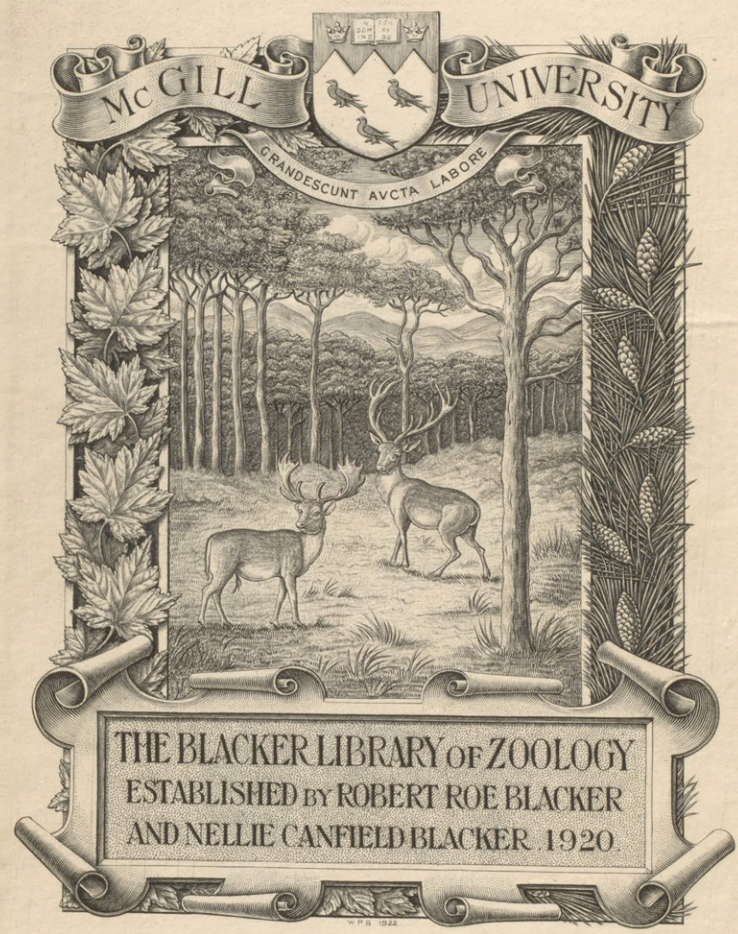
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HISTORY

OF

BRITISH BIRDS,

INDIGENOUS AND MIGRATORY.

William MacGillivray.

A

HISTORY

OF

BRITISH BIRDS:

~~INDIGENOUS AND MIGRATORY~~:

INCLUDING

THEIR ORGANIZATION, HABITS, AND RELATIONS.
~~REMARKS ON CLASSIFICATION AND NOMENCLATURE;~~
~~AN ACCOUNT OF THE PRINCIPAL ORGANS OF BIRDS, AND~~
~~OBSERVATIONS RELATIVE TO PRACTICAL~~
~~ORNITHOLOGY.~~

ILLUSTRATED BY

NUMEROUS ENGRAVINGS.

BY WILLIAM MACGILLIVRAY, A. M., LL.D.

MEMBER OF THE WERNERIAN NATURAL HISTORY SOCIETY OF EDINBURGH, OF THE NATURAL HISTORY SOCIETY OF PHILADELPHIA, OF THE LYCEUM OF NEW YORK, OF THE LITERARY AND PHILOSOPHICAL SOCIETY OF SOUTH CAROLINA; CONSERVATOR OF THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND LECTURER ON BOTANY TO QUEEN'S COLLEGE.

VOL. III.

RESTATORES, CREEPERS; SCANSORES, CLIMBERS; CUCULINÆ;
RAPTORES, PLUNDERERS, OR RAPACIOUS BIRDS;
EXCURSORES, SNATCHERS; VOLITATORES, GLIDERS;
JACULATORES, DARTERS.

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PREFACE.

It is under circumstances peculiarly pleasing that I now present myself to the public. I have accomplished half of my task, having completed the history of the entire series of British Land Birds. The few feeble sounds indicative of disapprobation, that were elicited by the appearance of my beautiful Cooers and Songsters, died away without an echo, and the rich burst of applause with which my charming favourites were hailed, still resounding in my ears, has inspired me with fresh energy. I am therefore confident that the present volume is in no degree inferior to its predecessors, and hopeful that it will be received with equal favour.

Several keen observers of birds have, to my sure knowledge, received from the information conveyed in these volumes, an impulse which will effectually prevent them from ever perverting nature by forcing her into quinary or ternary arrangements, or from dwindling into mere describers of skins, and indiscriminating compilers of correct, doubtful, and erroneous observations. Of such pupils I am proud, and if my exultation should be held as an indication of vanity, I cannot help it, for I am constrained to speak the truth. Should any man conceive himself injured thereby, I hope he may consider that in matters of science there ought to be perfect freedom of thought, and that a very obscure individual, like myself, may sometimes fall upon truths subversive of theories invented by men of the highest intellect.

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In my efforts on the present occasion I have been aided by several kind friends and successful observers. May they live to see my labours, in which they have taken so lively an interest, completed, and their object accomplished! From the south and the north, the east and the west, information has flowed in. Scarcely was my second volume published, when I received, from a gentleman resident in Leicester, who has long dedicated part of his time to the study of birds, an offer of assistance, which I gladly accepted, and congratulations, which excited the most lively emotions, seeing they came from a man of kindred sentiments, whose heart warmed toward one whose writings had afforded him pleasure. Well has that honourable and kind-hearted Englishman, Mr Harley, performed his promises, as the pages of this volume will shew. From the sea-girt rocks of Zetland, the voice of an old and dear friend has come to assure me of his sympathy and esteem. That friend, Dr Lawrence Edmondston, well known as an enthusiastic observer of birds, who has added much to our knowledge of those of his native country, has supplied me with several important articles, and will enrich the remaining volumes with the results of his investigations respecting the habits of the feathered denizens of his semi-Scandinavian Isles. A gentleman familiarly known to my readers, Mr Th. Durham Weir,—one of whose most strict and scrupulous adherence on all occasions to truth, of whose almost unrivalled perseverance and lyncean acuteness of observation, every one acquainted with him is well assured,—one who personifies honesty and integrity, those most precious but most rare qualities,—has not intermitted his benevolent efforts to forward my views. While he has thus poured in his contributions from the west, an Anglo-Norman in the east, my equally enthusiastic and most estimable young friend, Mr Hepburn, has favoured me with a mass of interesting observations, of which I have been obliged to select only a part, otherwise I should have extended the present volume much beyond its legitimate magnitude. Dr Robertson of Dunkeld, to whom I am personally unknown, has most generously presented me with specimens, and offered his aid in procuring more, as well as in supplying observations. The Rev. Mr

Gordon of Birnie, Mr Barclay, Mr Brown, Mr Duncan, and Mr Mactier, I feel pride in adding to the list of ornithological friends. With them too I must associate on this occasion one who, having finished his task of depicting and describing the birds of another and more extensive portion of the globe, has returned to his native land, Mr Audubon, to whom I am indebted for specimens of several of our rarer feathered visitants, and of stragglers from America, of which I have failed in procuring permission to examine those in Edinburgh.

To Mr Macduff Carfrae I again offer my warmest thanks for his liberal supply of bodies for dissection, and of recent and prepared specimens for description. To Mr Fenton also I am in like manner indebted; as well as to various individuals, far and near, from Oxford to Elgin, who have sent me eggs, nests, and birds. In short, circumstances are now very different with me from what they were, when, among the wild rocks of the Hebrides, I commenced my labours, without aid or sympathy, or when, twenty years ago, I first visited Edinburgh, where I was unknown to a single individual.

In this volume are contained descriptions of the birds to which I have given the ordinal names of Creepers, Climbers, Cuckoos, Plunderers, Snatchers, Gliders, and Darters, amounting to fifty-six species, together with two birds omitted in their proper places, and a species now first added to the British Fauna.

An Appendix contains observations supplementary to the three volumes now published; and at the end is a systematic Index to the Land Birds, in which they are disposed in families, in the order in which I conceive they may be most advantageously arranged. With regard to what I have called Practical Ornithology, I have found it necessary on this occasion to be somewhat less discursive than I could have wished. The anatomically disposed student however will find an account of the extensile tongue of the Woodpeckers, the organs of sense of the Rapacious birds, instructions for making skeletons, and the usual information respecting the alimentary canal of all the species of which I could obtain bodies, illustrated by numerous figures. In one of the chapters or Lessons under this head, is a valuable

Catalogue of the Land Birds of the County of Leicester, by Mr Harley.

The Engravings on Wood, which I think superior to those in the preceding volumes, have been executed by Mr Bruce, with the exception of a few by Mr Sclater; and those on steel, in the present, as well as the other volumes, by Mr Gellatly. The drawings for both have been made by myself, in every case from the objects which they are intended to represent.

Notwithstanding the labour and expense of preparing these volumes for the public, I am authorized to say that the fourth, containing the Waders, a great part of which is ready for the compositor, will be published before the third has been well dispersed. In it and the fifth or last, I promise descriptions equally correct, and probably more interesting, as many of the aquatic birds have been very carefully studied by me, under the most favourable circumstances.

W. MACGILLIVRAY.

Edinburgh, 1, Wharton Place,
1*st June* 1840.

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ESSENTIAL CHARACTERS OF THE ORDERS.

ORDER VI. REPTATORES. CREEPERS.

Bill of moderate length or elongated, slender, more or less arched, compressed, acute; upper mandible with moderate basal sinuses, filled by the nasal membrane, which is covered by short feathers, its edges slightly overlapping, with a small or obsolete notch on each side, close to the pointed tip. Œsophagus narrow, without dilatation; proventriculus oblong, with cylindrical glandules. Stomach roundish, somewhat compressed, with moderate lateral muscles, and dense rugous epithelium. Intestine short and rather wide; cœca reduced to very small cylindrical adnate tubes. Feet rather short; tarsus compressed; toes much compressed, the first large, the anterior three little separated; claws very long, moderately arched, extremely compressed, very acute. Wings of moderate length, broad, concave, rounded, with the first quill very short. Pl. XIV.

ORDER VII. SCANSORES. CLIMBERS.

Bill large, strong, nearly straight, angular, compressed and generally cuneate at the point; upper mandible with the nostrils concealed by the reversed bristly feathers of the narrow basal sinuses. Tongue extensile. Œsophagus of moderate width, without crop, but dilated below into a very large sac, on which the proventricular glands are dispersed. Stomach roundish, of small or moderate size, a little compressed, with a

thick muscular coat, and thin, dense, longitudinally rugous epithelium. Intestine of moderate length, and very wide; no cœca; cloaca very large and elliptical. Legs very short; tarsus short; first toe very short, sometimes wanting, directed backwards, as is the fourth or outer, which is equal to the third or longer, the second and third united at the base; claws remarkably large, much curved, extremely compressed, broadly grooved on the sides, and with the tips very acute. Wings large, much rounded, the first quill very small. Tail short or of moderate length, often rigid, of ten or twelve feathers. Pl. XIV.

ORDER VIII. CUCULINÆ. CUCKOOS.

Bill of moderate size or large, wide at the base, much compressed toward the end, somewhat arched and pointed; upper mandible with the ridge more or less arcuate, the edges notchless at the end, the tip decurved, acute. Tongue moderate, flattened, tapering. Œsophagus wide, without crop; proventriculus large; stomach very large, round, with its muscular coat thin, and the epithelium soft and rugous. Intestine of moderate length and width, with large oblong cœca. Toes broad beneath, first small, fourth directed backwards, second and third united at the base; claws moderate, curved, compressed, acute, that of the first toe sometimes much elongated. Wings long or moderate, much rounded. Tail long, graduated or rounded, of twelve broad feathers. Pl. XVI.

ORDER IX. RAPTORES. PLUNDERERS.

Bill short or moderate; upper mandible cerate at the base, without sinus, but with the nostrils perforated in the cere, the tip decurved, elongated, and pointed. Tongue short, concave, fleshy, rounded or emarginate. Œsophagus wide, dilated into a crop in the diurnal species; proventriculus wide; stomach very large, round, with its muscular coat very thin, and the

epithelium soft and rugous, or very thin. Intestine short and of moderate width, in a few species which feed on fish very long and extremely slender; cœca in the diurnal very small or obsolete, in the nocturnal oblong and large. Feet strong, with four toes, of which the outer is versatile in the nocturnal species; claws long, curved, tapering, very acute. Wings always large, but varying in length. Tail of twelve feathers. Pl. IV, V, XX, XXI.

ORDER X. EXCURSORES. SNATCHERS.

Bill short or of moderate length, very broad at the base, compressed only at the tip; upper mandible with rather wide basal sinuses, filled by the nasal membrane, which is feathered, the edges notched close to the decurved acute tip. Tongue narrow, flat, thin-edged, with the point slit or lacerated. Œsophagus wide, without crop; proventriculus oblong; stomach elliptical or roundish, moderately muscular, with the lateral muscles distinct, and the epithelium dense and rugous. Intestine short and wide, with very small cœca. Feet of moderate size or very small; tarsus slender; hind toe long and stouter, lateral toes nearly equal, anterior moderately spreading; claws rather long, curved or arched, much compressed, laterally grooved, very acute. Wings generally rather long, more or less rounded, with the first quill very small. Tail of twelve feathers. Pl. XXII.

ORDER XI. VOLITATORES. GLIDERS.

Bill very short in proportion to its breadth; mouth extremely wide; upper mandible with the tip very small, and the nasal sinuses feathered. Tongue short, flattened, sometimes very small. Œsophagus wide, somewhat funnel-shaped, but without crop; proventriculus moderate. Stomach broadly elliptical, moderately compressed, in the diurnal species muscular, with thin broadly rugous epithelium, in the nocturnal, very

large, with the muscular coat thin, the epithelium hard and rugous. Intestine short and wide, with small or obsolete cœca in the diurnal, but in the nocturnal large and oblong. Feet extremely small, with four toes, the anterior spreading; claws rather large, arched or curved, acute. Wings very long and pointed. Tail of twelve feathers. Pl. XXII.

ORDER XII. JACULATORES. DARTERS.

Bill large, angular, tapering, straight or arched, pointed; upper mandible with very short feathered nasal sinuses, and without notches. Tongue very small. Œsophagus very wide, funnel-shaped, without crop. Stomach large, round, with a very thin muscular coat, and a soft rugous epithelium. Intestine of moderate length, very slender; no cœca; cloaca very large and globular. Feet remarkably small and feeble; tarsus very short; toes short and very slender, the first small, broad and flattened beneath, the anterior three parallel and united in part of their length; claws arched, compressed, acute. Wings broad, rounded, with the first quill extremely small. Tail of twelve feathers. Pl. XXII.

In commencing a new volume, in which there will necessarily be much of the formality essential to the accurate description of organs, whether internal or external, one may, not inaptly, indulge in a little preliminary recreation. A walk into the fields cannot fail to refresh our feelings, enliven our sympathies, and prepare us for the task, not altogether one of unmixed delight, of composing or perusing eight hundred pages of ornithology. A history unembellished by fiction cannot be so entertaining as one in which facts are modified and accommodated to favourite theories, inferences drawn from loose statements, precise details represented as unimportant, and

mellifluous sentences constructed with little regard to common sense. There remains for me, then, only one method of giving a general interest to my descriptions, namely that of occasionally digressing from the subject, to connect it with those to which it naturally bears reference. If in the following pages some slight attempts at ornament may sometimes be made, the reader will not discover in them any fabulous incidents, or any facts so decorated as to lose their proper character.

Making a general inspection of our aërial and terrestrial birds, I might present some statements respecting their distribution, and the proportion of resident to migratory species; or, from facts supplied by observation, I might calculate how many bushels of grain are annually devoured by one set of birds, and how many millions of insects and worms by another; but, leaving such matters to the ingenuity of speculative minds, I prefer a visit to the fields, the woods, and the moors, on this beautiful day in the beginning of summer. Some pleasing, if not important, observations may be made, in the course of a long walk, in any part of the country, for, although not a single bird may occur that has not been often seen before, a lover of living nature is hardly ever tired with watching them.

What first attracts our notice is a colony of Rooks in the tall trees of the garden. In the hole of that broken limb of the old sycamore is a starling's nest, as you may be assured by the loud cries of its greedy young ones. These will suffice to remind us of the Vagatores. A few Sparrows are seen on the road, a beautiful Chaffinch chants his not unpleasing song on the beech-tree, two Green Linnets are flying about the hedge, and on the stone-wall a Corn Bunting creaks out its curious cry. These and other Deglubitores have already received our attention. Leaving the city, we enter a highly cultivated district, in which the fields, covered with corn and grass, are separated from each other by hawthorn fences and stone-walls. The rains which have lately fallen in profusion have imparted a healthy vigour to the vegetation. The merry carol of the Lark comes from on high, and the lively Whitethroat, flitting along the hedge, sings its more cheerful than melodious ditty

as it flies before us, then hovers a while, still singing, plunges into the bush, and emerges at a little distance. Scarcely two birds of this species have the same song, or at least, the voices of individuals differ greatly, and the parts of the performance are variously arranged. Although Larks also differ somewhat in this respect, there seems more uniformity in their song, so that an inattentive listener would scarcely perceive any difference between one individual and another. From among the trees by the brook issues the simple but finely cadenced song of the Willow Wren. The restlessness and frequent cheep of that Pied Wagtail, as it now runs along the pebbly beach, then betakes itself to a tree, and presently darts over head, betray its anxiety for its young. From the plantation on the hill side come at intervals the loud and mellow notes of the Blackbird, and now the delightfully modulated strain of the Garden Warbler. Other sounds mingle with these, but we have heard enough to remind us of our former observations on the CANTATORES. In the border of the grassy field, you may see running along a solitary Partridge, and several Wood-pigeons wend their way toward the distant wood. At present we have little chance of meeting with any other RASORES or GEMITORES.

On that columnar crag is the nest of a Kestrel, of which the situation is marked by a white spot, and in the wood beneath it one sometimes meets with the Tawny Owl. How beautifully these Swallows skim over the pool, now and then dipping as it were into the water! Some of them have fixed their nests in the window-corners of the farm-house, while others inhabit the holes of that sand-pit. To the RAPTORES and VOLITATORES, of which these birds are representatives, our labours will presently be directed. On the bank of the stream, at the commencement of that beautiful wood, there used to be the nest, or at least the hole, of a Kingfisher, the only permanently resident representative of the group which I name JACULATORES; and on the trunks of those tall trees, should one look sharply, he might discover the Creeper, which belongs to our REPTATORES; but the SCANSORES are so rare in this part of the country that we have no chance of meeting with a Woodpecker.

How beautiful those green woods of beech and lime, intermingled with stately pines, elms, and sycamores! The lilac with its lovely thyrsi, the bird-cherry with its white racemes, the laburnum profuse of pendulous yellow flowers, decorate the thickets. On the banks and in the shade of the woods are an hundred species of plants, the examination of which affords delight to that botanist, who, with trowel in hand, and three tin boxes slung to his person, rummages among the tangled roots. The blue hyacinth, the broad-leaved garlick, the purple-spiked orchis, the wild strawberry, the goldilock ranunculus, the creeping bugle, the whorled woodruff, the delicate oxalis, the granulated saxifrage, and many more are seen around us. But see, flitting from the tree to the rock, are two small birds, which from their peculiar cry of *chack*, *chack*, we know to be Grey Flycatchers. They represent our Excursores, not inaptly, as you observe, for one of them has sprung into the air, seized an insect, and returned to the pinnacle on which it had perched.

With the exception of the Woodpeckers, we have thus met with representatives of all our larger groups of land birds, unless we consider the Cuckoo as meriting a place for itself and its companions. As yet not a single bird has occurred of those which will form the subjects of my fourth and fifth volumes, namely the Wading and Swimming Tribes. But now we leave the shade of those beautiful woods, and enter on an open moor, partly covered with furze and heath. Were we to extend our walk, we should meet with the Lapwing, the Curlew, and the Snipe; but to observe the Swimmers, we should have to betake ourselves to the shores of the distant estuary, whose blue waters, and projecting headlands, form so conspicuously beautiful a portion of the extensive landscape presented to our view.

Let us seat ourselves on this mossy knoll, inhale the pure air, and gaze upon the blue hills that skirt the horizon, the extended plains, the green woods, and the brown moors. It is a beautiful, nay, a happy world, although filled with sin and sorrow. How lovely then must be that in which grief has no place,—in which the purified soul lives in the eternal sunshine

of God's love! Without gratitude for mercies, humility on account of frailties, hope for happier days, trust in providence, and an earnest desire to do good to our fellow men, our world, beautiful as it may be, would not be worth living in, and all our ornithology, however scientific and orderly we might make it, however pompously we might talk of it, and whatever applause it might elicit from admiring crowds, would be of no real advantage to us. Even as it is, the science that has reference merely to the things of time, seems to me a very small matter, hardly worth disputing about. And yet, when I descend from this mound, which to me is the temple of God, and shut myself up in my closet, to pen the pages of a History of British Birds, I shall sometimes forget to exercise that moderation toward opposing writers which conscience might approve.

But the sky is blackening in the west, large drops are beginning to fall, a thread of yellow light has shot across the gloom, and as heavy rain and thunder may be expected, let us betake ourselves to the Hunters' Tryst, and await the issue. I always feel excited and nervous during a thunder-storm. The glory of the dazzling flash, the pomp of the rolling mass of sound, the thick darkness, and the deluge of waters, impress me with terror and delight, wonder and dread. It is like the valley of the shadow of death. When the clouds are past, and the bow of promise gladdens the eye, and the glorious sun shines in the clear blue sky, a gladness tempered with awe comes on the soul, a feeling like that which I hope may be mine and thine, good reader, when the last trumpet shall summon us before the judgment-seat.

from p. 76. vol. II.

ix. Reptatorial Birds.

Order IV ~~VI.~~ REPTATORES. ~~CREEPERS.~~

By the ordinal name of Reptatores, or Creepers, may be designated an extensive group ~~of birds~~, which agree in possessing certain forms of the bill and feet that render them peculiarly adapted for procuring insects and larvæ in the crevices of the bark of trees. But the habits of creeping and climbing are not confined to those birds which have the tail-feathers so stiffened as to be used for the purpose of supporting them while they cling to the surface. For example, the Black-and-White Creeper of America, Mniotilta varia of Vieillot, Certhia varia of Wilson, is described as precisely similar in its mode of life to our Common Tree-Creeper, Certhia familiaris. That bird however belongs to the family of Sylvicolinæ, and differs little from Sylvicola coronata, unless in having the bill considerably longer, and the claws much stronger. This latter species is said to feed on insects, caterpillars, berries, and seeds, but does not climb and creep in the manner above described.

The species to which collectively I give the name of ~~Creepers are intimately connected on one hand with the Sylvianæ and Sylvicolinæ, some of which, as may be seen from the above statement, are actually creeping and climbing birds, on another with the Parinæ, some of which also creep and climb, and again with the Paradiseanæ, which belong to the order Vagatores. They~~ may be generally described as having a more or less elongated, slender, acute bill, well adapted for being insinuated into the fissures of the bark of trees; the tarsi short and slender; the

toes also slender, the anterior parallel or more or less syndactylous, the hind toe very stout; the claws large, extremely compressed, arched, and very acute. It must here however be stated that in this order the form of the bill varies extremely. There is a small group or genus of South American birds, to which the name of Dendrocolaptes has been given. The different species of this genus are so like each other in form, proportions, plumage, and colour, that, in so far, one description might almost answer for all. Their feet are syndactyle, and adapted for climbing, the toes being long, with strong, curved, acute claws. But the bill, which commonly affords the best generic character, is so different in the different species, that while in one it is not very unlike that of a Flycatcher, in another it resembles that of an Epimachus, as may be seen from the accompanying engravings.

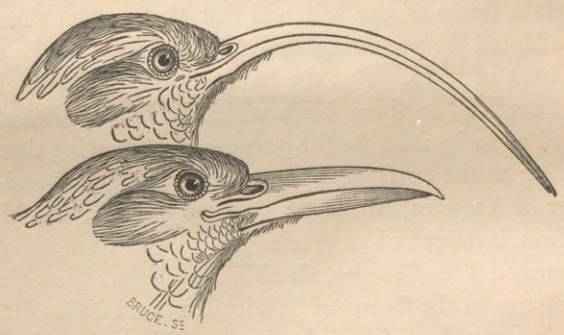


Fig. 186.

In defining this genus, then, nothing more explicit can be said of the bill than what we find in Temminck's character of it:— "The form of the bill difficult to be indicated by general characters; depressed and trigonal at the base, compressed or slender at the point; without notch; straight or more or less curved, with scarcely any nasal groove." Seeing, then, that in a very natural genus of this order, the form of the bill varies so much, we must expect to find in the different families and genera, variations more remarkable than in most other orders. The only universal character is that of the syndactylous feet, having long slender toes, of which the three anterior are as it

were pressed close together, the third and fourth actually united in a great part of their length, the first always long and directed backwards, the claws strong, extremely compressed, and acute.

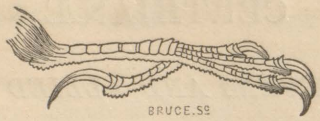


Fig. 187.

Now, the birds which exhibit this character in the greatest perfection, may be arranged so as to form several natural groups or families. Those of which the bill approaches nearest in form to that of the smaller Sylvianæ, and which in the same manner have the peculiar characters of the feet less developed, are the *Melliphaginæ* and the *Certhiinæ*, the latter including among others the genera ~~Anorthura~~, Certhia, Thyrothurus, Tichodroma, and Upupa. One of these genera, namely Certhia, composed of a few species, has the feathers of the tail depressed, and stiffened. This character is common to all the members of another family, although in some genera the shafts do not protrude. It is composed of the genera Dendrocolaptes, Sclerurus, Oxyurus, Furnarius, Synallaxis, Anabates, and others, and may be named *Dendrocolaptinæ*. The genera Promerops, Epimachus, Cinnyris, Nectarinia, and others constitute the family of *Cinnyrinæ*. Lastly, the *Sittinæ* formed of the genera Sitta, Climacteris, and a few others, lead us ~~back~~ to the Parinæ, which they greatly resemble in form and habits, while they are also in several respects assimilated to the Woodpeckers.

Not being satisfied as to the accordance of this association of species with rational principles of classification, because I have not enjoyed opportunities of making myself acquainted with the structure, and especially the digestive organs of a sufficient number of these birds, I shall not offer any extended remarks on the different families above indicated, but proceed as directly as is consistent with the method which I have adopted, to give the history of the very few species that occur in Britain.

Family I. CERTHIANÆ. Certhiine Birds.

TREE-CREEPERS AND ALLIED SPECIES.

The Certhianæ are birds of small size, having the body short, ovate, and compact; the neck generally short; the head rather large and ovate; the bill of moderate length or elongated, slender, in some degree arched, with the notches obsolete, the tip acute. Internally both mandibles are very narrow, concave, with a central prominent line. The tongue is usually very slender, emarginate and papillate at the base, channelled above, tapering, with the point thin-edged, bristly, and rather obtuse. The digestive organs differ little from those of the Sylvianæ, the œsophagus being of moderate width and nearly uniform diameter; the proventriculus oblong; the stomach elliptical, moderately muscular, the epithelium dense, with large longitudinal rugæ; the intestine rather short and wide; the cœca very small, the cloaca globular. The trachea ~~is also similar~~ to ~~that of the Cantatores, having~~ has four pairs of ~~distinct~~ inferior laryngeal muscles. Plate XIV, Fig. 1, 2.

The nostrils are linear or oblong, exposed; the eyes of moderate size; the aperture of the ear large, and roundish. The plumage soft and blended; no bristle-feathers at the base of the bill. Wings rather short, broad, concave, much rounded, the first quill short; tail short or of moderate length, rounded. Anterior toes spreading little, coherent at the base, extremely compressed, the outer longer than the inner, the hind toe very long; claws long, arched, extremely compressed, acute.

To this group belong the genera ~~Troglodytes, nearly allied to the Sylvianæ, Thyrothurus,~~ Certhia, Tichodroma, and Upupa. Only ~~three~~ two species, ~~Anorthura Troglodytes,~~ Certhia familiaris, and Upupa Epops, occur in Britain.

Genus I. Certhia. p. 31.

Genus VIII. Troglodytes. Cuv. Wren.
~~ANORTHURA~~. ~~WREN~~.

Bill of ordinary length or rather long, slender, tapering, acute, slightly arched, subtrigonal at the base, compressed towards the end: upper mandible with its dorsal outline slightly arched, the ridge narrow, obtuse, the sides sloping at the base, towards the end slightly convex and erect, the edges sharp, direct, and overlapping, without notch; lower mandible with the angle narrow and rather acute, the dorsal outline straight, the back narrow, the sides convex, the edges sharp and inflected, the tip very narrow; the gape-line very slightly arched.

The upper mandible within is concave, with a central prominent line; the lower deeply channelled. The tongue sagittate, very slender, tapering, concave above, slightly jagged towards the tip. The œsophagus of moderate width, without dilatation; the stomach roundish, very muscular, with a dense longitudinally rugous epithelium; the intestine short and rather wide, the cœca very small. Plate XIV, Fig. 1.

Nostrils linear-oblong, wider at the proximal extremity, exposed, with an oblong operculum; the nasal depression rather large, narrow, feathered at the base. Eyes of moderate size; eyelids feathered. External aperture of ear large, roundish.

The general form is full and short, the body ovate, the neck short, the head ovate and of moderate size, the wings and tail short; the feet of ordinary length; the tarsus compressed, anteriorly covered with seven scutella, of which the upper are indistinct, posteriorly edged; toes rather large, compressed; first large, and longer than the two lateral, of which the inner is a little shorter, the third much longer; the third and fourth coherent as far as the second joint of the latter. Claws long, arched, extremely compressed, laterally grooved, acute.

Plumage soft and blended, the feathers ovate, loose, with a very slender elongated plumule. There are no bristle-pointed

Troglodytes. Wren.

feathers at the base of the bill. Wing shortish, broad, concave, semi-ovate, much rounded, first quill half the length of the second ; third, fourth, fifth, and sixth longest, and nearly equal ; primaries ten, secondaries nine, all rounded. Tail short or of moderate length, rounded, generally raised, and of twelve weak, rounded feathers.

The Wrens are nearly allied ~~on the one hand~~ to the Phylloپneustæ and Reguli, ~~and on the other to the Certhiæ, differing~~ ~~however in several essential respects from all~~ these genera. But have the ~~Their~~ bill ~~is~~ more compressed and arched ~~than that of the Phyllopneustæ and Reguli, but less so than that of the Certhiæ~~. Their feet are stouter than those of the Reguli, but otherwise very similar ~~; and the claws of both genera, although long, are proportionally shorter than those of the Certhiæ~~. In ~~Anorthura, the tail is usually but not always raised or cocked, whereas in Certhia it is just the reverse. Nevertheless all these genera are very nearly allied, and their food is the same, although their~~ haunts are somewhat different. ~~The Reguli search for insects and pupæ upon the twigs and among the leaves of trees and shrubs ; the Certhiæ in the chinks of the bark of the stems and larger branches ; and the Anorthuræ among stones and on low shrubs.~~

From the form of their body, and the shortness of their wings and tail, their flight is direct, being performed by rapidly repeated flaps. They inhabit both continents, some of the species extending as far north as any other small birds of a similar nature. Their colouring is generally dull, or at least not in any case remarkable for brilliancy. They construct a very bulky nest, of which the interior is composed of moss and other soft materials, and often lined with feathers. The eggs are numerous, that is from five to eight, or even more, generally white or very light coloured, more or less dotted or spotted.

Only a single species occurs in Britain, where it is a permanent resident, and generally distributed. It is the only species hitherto found on the continent, although the existence of another in Italy is conjectured. In North America however, there are several species, whose habits generally resemble those of ours, and of which one is so similar that it can scarcely be distinguished.

~~ANORTHURA~~ TROGLODYTES. EUROPEAN WREN.



Fig. 188.

Motacilla Troglodytes. Linn. Syst. Nat. I. 337.
Motacilla Troglodytes. Lath. Ind. Orn. II. 547.
Wren. Mont. Orn. Dict.
Troglodyte ordinaire. Sylvia Troglodytes. Temm. Man. d'Orn. I. 233.
Troglodyte ordinaire. Troglodytes vulgaris. Temm. Man. d'Orn. III. 160.
Common Wren. Troglodytes Europæus. Selb. Illustr. I. 390.
Troglodytes Europæus. Common Wren. Jen. Brit. Vert. An. 153.

Upper parts reddish-brown, lower light greyish-brown; a brownish-white streak over the eye, the hind parts of both surfaces barred with dusky, two transverse bands of white dots on the wings.

Male.—The Wren is one of the most familiarly known of our small birds, being rendered remarkable, not less by its peculiar form than by the liveliness of its motions. Next to the Robin, it is perhaps the least liable to molestation from boys and idle people; and for this security it is indebted partly to its small size, and partly to its cheerfulness and innocence. Its aspect is so peculiar that every person must have taken notice of it as differing from that of other small birds, the body being short and full, the tail elevated or erected, the wings short, the head of moderate size, the bill very slender, and the feet moderate. The various parts having been described in the generic character, and there being no other species of the genus in this

country, it is unnecessary to repeat here the details already given. The tongue is four-twelfths and three-fourths in length. The œsophagus is an inch and eight-twelfths in length; the stomach five-twelfths long, and of the same breadth, with the lateral muscles very distinct; the intestine five inches long, two-twelfths in width in the duodenal portion, one-twelfth toward the cœca, which are only one-twelfth long. The trachea has four pairs of inferior laryngeal muscles. On the first toe are twelve, on the second eleven, on the third thirteen, on the fourth twelve scutella. When the toes are brought together, the first is nearly as long as the third, the claws included, and the lateral, of which the outer is very slightly longer, are much shorter. The plumage is soft, tufty, unglossed, the feathers ovate, with loose barbs, and very slender elongated plumules. The wing is shortish, broad, considerably curved or concave, and much rounded, of nineteen quills, which are all rather broad and rounded, the first about half the length of the second, which is rather more than a quarter of an inch shorter than the third; the fifth is longest, but the fourth and sixth are nearly equal; the rest diminish very slowly, and the inner secondaries are not elongated. The tail is short, much rounded, of twelve slightly curved, narrow, very weak, feathers. Pl. XIV, Fig. 1.

The bill is dusky-brown above, the edges of the upper mandible, and two-thirds of the lower brownish-yellow, the tip of the lower greyish-brown. The inside of the mouth, the tongue, and the soft skin at the commissure of the mandibles, bright orange. The irides dark brown, the tarsi and toes pale greenish-brown, as are the claws. The general colour of the upper parts is reddish-brown, darker on the head, brighter on the tail-coverts, quills, and tail. There is a white spot near the tips of the posterior dorsal feathers, which, however, is hardly perceptible when they are laid. The secondary coverts, and the first small coverts, have each a white spot at the tip. The wing-coverts and quills are banded with deep-brown and brownish-red; the margin of the reddish bands of the five outer quills reddish-white. The tail is undulatingly barred in the same manner; the dorsal feathers and tail-coverts very obscurely so. A brownish-white line passes from the upper man-

dible over the eye, the cheeks are brown, obscurely spotted with paler. The fore-neck and breast pale greyish-brown; the sides and abdomen barred with brownish-white and dusky; the lower tail-coverts brownish-red, barred with dusky, and having the tip white.

Length to end of tail $4\frac{1}{4}$ inches; extent of wings $6\frac{1}{2}$; bill along the ridge $\frac{5\frac{1}{2}}{12}$, along the edge of lower mandible $\frac{7\frac{1}{2}}{12}$; wing from flexure $1\frac{1}{12}$; tail $1\frac{1}{2}$; tarsus $\frac{8}{12}$; first toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{4}{12}$; second toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{2}{12}$; third toe $\frac{6\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; fourth toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{2}{12}$.

Female.—The female is considerably smaller, and less brightly coloured, with more brown on the lower parts, but otherwise similar to the male.

Length to end of tail 4 inches; extent of wings $6\frac{1}{4}$; bill along the ridge $\frac{5}{12}$.

Variations.—Very considerable differences occur in the size of individuals, and some have the bill much longer and more curved than others, insomuch that I was at one time impressed with the idea of our having two species of Wren; but more extended observation and comparison have convinced me that these differences, and others seen in the tints of the plumage, are neither so constant nor so decided as to afford specific characters. When the feathers are worn in summer, the small white spots on the wings become obliterated. Old individuals have the upper parts of a redder tint, and the lower with more white.

Habits.—Excepting the Kinglets, the Creeper, the Chiffchaff, and the smaller Tits, the Wren is the least of our native birds. Its flight is effected by a rapid and continuous motion of the wings, and therefore is not undulated, but direct; nor is it sustained, for the bird merely flits from one bush to another, or from stone to stone. It is most frequently met with along stone-walls, among fragments of rocks, in thickets of whins, and by hedges, where it attracts notice by the liveliness of its motions, and frequently by its loud chirring noise. When

9

standing, it keeps its tail nearly erect, jerks its whole body smartly; then hops about with great alacrity, using its wings at the same time, and continually enunciating its rapid *chit*. Although it seldom ascends a tree directly, like the Creeper, it may often be seen climbing sidewise to some height, and on fences or bushes it usually makes its way to the top by hopping from one spot to another. If usually pleased with a low station, it yet sometimes ascends even to the higher branches of very tall trees, and may occasionally be seen there in company with Kinglets and Tits. In spring and summer, the male has a very pleasing, full, rich, and mellow song, which it repeats at intervals; and even in autumn, and on fine days in winter, it may occasionally be heard hurrying over its ditty, the loudness and clearness of which, as proceeding from so diminutive a creature, is apt to strike one with surprise, even after it has long been familiar to him.

During the breeding season, Wrens keep in pairs, often in unfrequented parts, such as bushy dells, mossy woods, the banks of streams, and stony places overgrown with brambles, sloes, and other shrubs; but towards the end of autumn they approach the habitations of man, and although never decidedly gregarious, sometimes appear in small straggling parties. They are not properly speaking shy, as they seem to conceive themselves secure at the distance of twenty or thirty yards, but, on the approach of a person, conceal themselves in holes between stones, or among the roots or bushes. In liveliness and activity, the Wren rivals the Kinglets, Tits, and Creepers, as indeed might be expected from its diminutive size, birds as well as quadrupeds being generally more slow in their motions the larger their bulk.

Small as the Wren is, it seems to receive as little injury from severe weather as any of the larger birds, although after long-continued frosts, it is said that individuals have often been found to have perished. For myself, I have never met with a dead Wren at all, and should conceive such an occurrence as extremely rare, as the birds would in all probability die in their holes. In the midst of winter I have met with it in the valleys of the Grampians, among the wild woods, where no other

small birds were to be seen, unless a few Tits and Creepers. Yet it is not the less true that at this season it prefers the vicinity of houses. But the Wrens do not all in summer remove to the wilds, any more than the Robins, many individuals of both species remaining in gardens, shrubberies, and such sheltered places, where they breed, as well as in sequestered spots.

A pleasant little fable, of which the Wren is the hero, is told by the Hebridians. At an assembly of the birds the Eagle was boasting of his strength, asserting that he could mount higher in the air than any of earth's inhabitants; when up started the little Wren, and flatly contradicted the tyrant, challenging him to a trial of speed. The eagle regarded his puny rival with contempt, but accepting the challenge, or desirous of displaying his powers, spread out his huge wings, and launched into the air. Up rose the royal bird in majestic gyrations, over the assembled tribes, up beyond the mountain tops, up beyond the streaks of grey vapour, up beyond the specks and lines of the white cirri and cinocumuli that floated in the blue ocean of ether, up until he seemed but a point in the eye of the Goshawk and Peregrine, who watched his progress with more envy than admiration, and of the Raven, who thought he could mount as high himself,—still up, until he vanished entirely from the sight of most of the other birds, who were not accustomed to look so far into the sky. But where was the little Wren all this time? Had he crept with shame into some hole, or been unwittingly trampled to death by the broad foot of some gazing gander, or the still broader of the pillar-legged pelican? At length the eagle stops, gasping for breath, with swollen eyes and palpitating heart, unable to ascend a foot farther, and, spreading wide his wings and tail, floats in the dazzling light. The little vain-glorious thing that had defied him he knows has been left at least a mile behind. But lo! up again starts the Wren, who had nimbly perched on the eagle's back, and kept himself concealed among the feathers. With a hop, and a jerk of his tail, and a glance of pride, up springs the little wren into the region of vacuity, and fluttering there for a moment sings his song of triumph. The eagle casts a glance of mortified pride upon him,

which he heeds not, but seizing a feather of his rival's neck, descends in safety to the ground, to receive the prize to be impartially adjudged by the astonished conclave. The moral of the fable is, that cunning may supply the lack of power.

I know not a more pleasant object to look at than the Wren: it is always so smart and cheerful. In gloomy weather, other birds often seem melancholy, and in rain the Sparrows and Finches stand silent on the twigs with drooping wings and clotted plumage; but to the Wren all weathers are alike. The big drops of the thunder-shower no more wet it than the drizzle of a Scotch mist; and as it peeps from beneath the bramble, or glances from a hole in the wall, it seems as snug as a kitten frisking on the parlour rug.

It is amusing to watch the motions of a young family of Wrens just come abroad. Walking among furze, or broom, or juniper, you are attracted to some bush by hearing issue from it a lively and frequent repetition of a sound which most resembles the syllable *chit*. On going up you perceive an old wren flitting about the twigs, and presently a young one flies off, uttering a stifled *chirr*, to conceal itself among the bushes. Several follow in succession, while the parents continue to flutter about, in great alarm, uttering their loud *chit*, *chit*, *chit*, with indications of varied degrees of excitement. On open ground a young Wren might easily be run down, and I have heard it asserted that an old one may soon be tired out in time of snow, when it cannot easily conceal itself. And yet, even in such a case, it is by no means easy to keep it in sight, for on the side of a bank, or by a wall, or in a thicket, it will find a hole where one least expected it, and, creeping in some crevice beneath the snow, re-appear at a considerable distance.

The food of birds can be determined only by opening their crops and stomachs, or by observation directed to living individuals, the former method however being the only sure one. The wrens which I have opened generally contained remains of insects of various kinds, with larvæ, and sometimes pupæ; but I have also found in them seeds, and Mr Neville Wood states that they sometimes eat red currants. In the stomach of an individual examined in December 1830, I found "many

small hard seeds, an entire pupa, and numerous fragments of the shells of pupæ and elytra of coleopterous insects." So small a bird having so slender a bill, might doubtless be taken as a typical entomophagist; but it is probable that no species of this order confines itself exclusively to insects.

The Wren pairs about the middle of spring, and begins early in April to construct its nest, which varies much in form and composition, according to the locality. One brought me by my son, and which he found while gathering plants in a wood near Melville Castle, is of astonishing size compared with that of its architect, its greatest diameter being seven inches, and its height five. It presents the appearance of a rude mass of decayed vegetables, of an irregularly rounded form. Having been placed on a flat surface under a bank, its base is of a corresponding form, and is composed of layers of decayed ferns and other plants, mixed with twigs of herbaceous and woody vegetables. Similar materials have been employed in raising the outer wall of the nest itself, of which the interior is spherical, and three inches in diameter. The wall is composed of mosses of several species, quite fresh and green, and it is arched over with fern leaves and straws. The mosses are curiously interwoven with fibrous roots and hair of various animals, and the inner surface is even and compact, like coarse felt. To the height of two inches there is a copious lining of large soft feathers, chiefly of the Wood Pigeon, but also of the Pheasant and Domestic Duck, with a few of the Blackbird. The aperture, which is in front, and in the form of a low arch, two inches in breadth at the base, and an inch and a half in height, has its lower edge formed of slender twigs, strong herbaceous stalks, and stems of grasses, the rest being felted in the usual manner. This nest is a magazine of botany, there entering into its composition, leaves of Fagus sylvatica, fronds of Aspidium dilatatum and A. Filix-mas, blades of Phalaris arundinacea, stems of several grasses and other herbaceous plants, some twigs of the larch and other trees, and four or five species of Hypnum. It contained five eggs, of an elongated oval form, averaging eight lines in length, and six lines in breadth, pure white, with some scattered dots of light red at the larger end,

one of them with scarcely any, and another with a great number. Of three nests presented to me by Mr Weir, one is extremely beautiful, being composed entirely of fresh green hypna, without any internal layer, although, no eggs having been found in it, it possibly had not been completed. It is of an oblong form, seven inches in length, and four in its transverse diameter. The mouth measures an inch and eight-twelfths across, one inch and a twelfth in height. Its lower part is formed of small twigs of larch laid across and interwoven, so as to present a firm pediment. The longitudinal diameter of the interior is three inches and a half. Another, formed on a decayed tuft of Aira cæspitosa, is globular, six inches in diameter, and composed of moss, with a lining of hair and feathers, chiefly of the domestic fowl. The third is globular, and externally formed almost entirely of ferns, like that described above. In all the nests of this species which I have seen, the lower part of the mouth was composed of twigs of trees, or stems of herbaceous plants, laid across, and kept together with moss and hair.

The nests are found in a great variety of situations:—very often in a recess overhung by a bank, sometimes in a crevice among stones, in the hole of a wall, or of a tree, among the thatch of a cottage or out-house, on the loft of a shed or barn, the branch of a tree, whether growing along a wall or standing free, among ivy, honeysuckle, clematis, or other climbing plants. When the nest is on the ground, its base is generally formed of leaves, twigs and straws, and its exterior is often similar; but when otherwise, the outer surface is generally smooth, and chiefly composed of moss.

Several authors have spoken of the nests frequently constructed by this bird in spring, and afterwards abandoned, and have indulged in various conjectures respecting them. I should suppose that a nest may occasionally be partially or entirely built, and then deserted because its owners find it unsafe, or have been frightened from it. The Magpie often commences a nest and leaves it unfinished, probably for the same reason; and the same remark may be made as to the Blackbird and Thrush.

But Mr Wood relates a very curious fact respecting the Wren, which is that it "often builds itself a dwelling in autumn, and lodges in it on cold nights. These nests," he continues, "are mostly constructed in the usual localities, though I once found one situated in an old Garden Thrush's nest, in a Portugal laurel. Frequently, also, the nests in which one or two broods had been reared in summer, are tenanted every night throughout the winter."

On this subject Mr Weir has sent me the following remarks. "'During the period of incubation, the male' (says an anonymous writer in Mr Loudon's Magazine) 'apparently from a desire to be doing something, constructs as many as half a dozen nests in the vicinity of the first, none of which are lined with feathers; and whilst the first nest is so artfully concealed as to be seldom found, the latter are very frequently seen.' With respect to the use of these structures, or cock-nests, as they are called in England, if we believe that birds, like some insects, have foresight, a more ingenious theory might be advanced. During the severity of winter they may be intended as houses of refuge for them and their families. Whether this be always the case or not, it will be difficult to ascertain. That they are however sometimes employed for this purpose I can affirm, as the whole of those in my neighbourhood, during the late severe frosty weather (of 1837–8) were occupied by them. I have one of these nests in my possession, in which they lodged, and in which there was a quantity of their droppings." The Wren being a very diminutive bird might be supposed to require this kind of shelter in winter, were it not that the Kinglets and Tits, equally small, are not known to lodge in their nests. Our little friend is a Troglodyte, a frequenter of holes and caverns, and as it always reposes at night in some sheltered retreat, it may occasionally or often betake itself to its old nest as well as to any other place, as that nest is well fitted for its purpose; but there seems no reason for supposing that this is habitual with all wrens, many of which, in the wilder parts of the country, and in the Hebrides, desert their summer habitations and in winter reside about the farm yards.

On the 21st of February 1839, he again writes:—"I

mentioned that during the last severe winter, 1837–8, all the nests of the kitty-wrens which wanted the lining of feathers, were occupied by them as their places of repose. I have this winter paid a little more attention to this curious fact. In June last, in a plantation in my neighbourhood, a pair of wrens built three nests at no great distance from each other. The one in which they reared seven young ones had a lining of feathers, the other two had none. Every night this winter, when the ground was covered with snow, or the weather was very cold, one of the nests without the feathers was inhabited, I suppose, by the same family, as one of the wrens a little after sunset stood within a few inches of the nest and continued chirring until the other eight arrived. It was amusing to observe with what astonishing rapidity they answered the call, and flew from all quarters to their tight little dormitory. Their instinct was wonderful. When the wind was from the west, they occupied the nest which had its mouth to the east, and when the wind was from the east they took possession of the other one which had its aperture to the west."

The same gentleman, whose observations enrich this volume, has transmitted to me an account of the building of a nest, as extracted from his note-book: "May 30, 1837.—I this day had a favourable opportunity of observing the erection of one of the neatest of our British nests. Yesterday a pair of common Wrens flew about for a considerable time, in a particular spot in my shrubbery, as if in search of a proper situation for constructing the dwelling which should contain their intended brood. About a quarter past six o'clock this morning, they appeared to be engaged in the most serious consultation. They hopped up and down amongst the branches of a Spanish juniper, each of which they surveyed with particular attention. At seven o'clock, in one of its clefts, about two feet from the ground, with the decayed leaf of a lime tree, the female began to lay the foundation of her building. Although two men were casting a drain within seven yards of it, yet she, like a steady and active workman, was so bent upon the completion of her design, that she laboured as if unaware of their presence. Her perseverance was indeed astonishing, for she sometimes carried

in bundles of leaves nearly as bulky as herself. To her beloved partner she seemed to give ecstatic delight, for he sat upon the branch of a Portugal laurel a few feet above her, viewing most anxiously her operations, and now and then having mounted to the top of a plane tree, he poured forth his distinct and sweetly modulated notes, which during the day he continued to do almost incessantly. To her he gave but little assistance, thinking no doubt that his song, 'with all the little blandishments and soothing arts,' was sufficient to alleviate her fatigues, and to support her under them. That singing produces general excitement, and a power of more energetic performance in all the labours which the birds can undertake, is indeed an opinion entertained by some naturalists. Between eight and nine o'clock she was most actively employed, for during the space of ten minutes, she sometimes carried in four, five, and even six bundles of leaves, in the selection of which she seemed to be very careful, for I observed that after she had minutely examined them, when they did not seem to suit her purpose, she let them drop. I was surprised at the quantity which she collected for the foundation of her nest. After having rendered it compact by pressing the leaves with her breast, and turning herself round upon them in all directions, she began to rear its sides. In this operation, however, she was not so expeditious, as she was under the necessity of flying to a greater distance for materials, in the search of which she sometimes remained out eight and ten minutes. From the inside she built the under part of the aperture with the stalks of leaves which she felted together very ingeniously with moss. The upper part of it was constructed solely with the last mentioned material. To round it, and give it the requisite solidity, she pressed it with her breast and wings, and turned her body in different directions. Most wonderful to tell, about seven o'clock in the evening, the whole external workmanship of this snug little building was almost complete. Being very anxious to examine the interior of it, I went out for that purpose at half-past two o'clock next morning. I introduced my finger, and so close was it, that it resisted some very heavy showers of rain. Should any one wish to have his ears delighted with the sweet melody

of the songsters of the woods, he must awake and roam about at this early hour. It is then that they seem to be in ecstacy, and strive to rival one another in the richness and variety of their notes. At ten minutes past three o'clock, the male hopped round and round, and if I may judge from his appearance, surveyed with satisfaction the commodious fabric, in the erection of which his consort had taken the active part. He then flew to the top of a tree, and sung in the most animated strains. At half-past three o'clock, the female went into her nest, in which she remained for five minutes, and rounded the entrance into it, by pressing it with her breast, and the shoulders of her wings. Between half-past three and half-past four o'clock, she went in five times, with very fine moss in her bill. With the greatest care she surveyed the whole of her edifice. At half-past four she went in twice with very tender moss, with which she adjusted a small depression in the fore part of it. After having remained out for twenty minutes, she returned with a bundle of leaves to fill up a vacancy which she had observed in the back of the structure. Although it was an exceedingly cold morning, accompanied with a boisterous wind and rain, the male sang most delightfully. Between seven and eight o'clock, he having either received a reproof from his wife, or regretting his former remissness, assisted her more frequently than he had done yesterday. During the space of ten minutes they went into their abode, generally two and three times, with moss in their bills. At eleven o'clock, she flew off with him to some distance, in order, I suppose, to enjoy a little relaxation from her labours. They did not return until a quarter past one o'clock. From one to four o'clock, they went into their nest twenty-seven times, at different periods, sometimes only once in ten minutes, and at other times more frequently, with fine moss in their bills. From four to nearly five o'clock, the female carried in a feather three times, and brought to a conclusion the operations of the day.

"Thursday, 1st June.—I went out a little past six o'clock. They had not however as yet visited their residence, which I knew from having put a very slender stalk of a leaf in front of the door, which they were obliged to remove before they could

get admittance. They commenced their work at half-past eight, between which time and ten o'clock they went in at the rate of five times in eight minutes. The male frequently assisted the female this morning, and every time that he did so, he mounted to the top of the nearest tree, and proclaimed aloud his note of self-approbation. From ten till a quarter past eleven o'clock they went in about three times in the course of ten minutes, carrying very small quantities of fine moss. The female then flew off with her mate, and remained almost the same space of time that she had done yesterday, for she did not return to her nest until about half-past one o'clock. From this time until half-past two o'clock, when they ceased from their labours, they frequently brought in fine moss and feathers.

"*Friday*, 2*d June*.—This morning between five and seven o'clock the male sang almost incessantly. They did not begin to build until half-past nine o'clock, when they went in with fine moss and feathers, sometimes once in ten, at other times once in fifteen and twenty minutes. About half-past eleven both flew off together, and did not return until about a quarter before two o'clock. They carried in fine moss and feathers only a few times after this. Whilst I was anxiously watching their motions from the midst of a very thick arbor-vitæ tree about nine feet from their nest, the female having noticed me, set up her cry of alarm. The male upon hearing it appeared to be in a state of great irritation. I immediately ran off to some distance, pursued by the little creatures scolding me with great vehemence.

"*Saturday*, 3*d June*.—Between six and eleven o'clock they brought in a few feathers and some moss. They then disappeared until half-past one o'clock, when they took in a few more feathers, and then rested from their work.

"*Monday*, 5*th June*.—I carefully examined the nest this morning before the wrens commenced their labours. They appeared to have carried in yesterday nearly the same quantity of materials as they had done on the preceding day. They did not begin to build this morning until twenty minutes before eight o'clock. Between eight and nine o'clock they went in at the rate of two times in ten

minutes with fine moss and feathers. From nine until half-past eleven o'clock, they went in nine times at different intervals, carrying feathers. After this they were not seen for two hours and a quarter, and brought in only a few feathers in the afternoon.

"*Tuesday*, 6*th June*.—This morning, between seven and ten o'clock, they carried in feathers ten times at different intervals,—sometimes once, at other times twice, in ten minutes, and a very few of them after ten o'clock.

"*Wednesday*, 7*th June*.—This morning, between eight and ten o'clock, they flew in with a few feathers, and then left off working.

"*Thursday*, 8*th June*.—At eleven o'clock this forenoon the nest was finished. It was by far the neatest of the kind that I have seen; and little wonder, when we consider the long time which they had taken in its construction. I regret that, on the following morning, it was torn down by a cat which frequented the neighbourhood. The female, in going into it to lay her first egg, attracted its notice, and had in all probability been devoured, as I never saw her again."

What energy and activity on the one hand, enthusiasm and resolute perseverance on the other! No man ever before so gave us the history of the erection of a wren's nest, and certainly none ever watched birds with half the firmness of my esteemed friend, who thus concludes the letter containing the above:—"If you have glanced over these hurried remarks, which were taken out of my note-book, I am sure that you must have exclaimed 'Alas! alas! I am afraid that my west-country correspondent, poor fellow! is now labouring under ornithomania.'" Truly, I made no such exclamation; for I have long been aware of Mr Weir's "affection," which I believe is incurable.

Mr Durham Weir, after mentioning the number of eggs which he has discovered in the nests of the wren, has favoured me with a statement respecting the feeding of its young, which is of great importance as elucidating the habits of this bird in a matter not previously made a subject of observation. The number of eggs which it lays has been variously stated by authors. Mr Weir

says that although it is commonly seven or eight, so many as sixteen or seventeen have been found in its nest: "Robert Smith, weaver in Bathgate, told me, that a few years ago, he saw in a nest, which was built on the bank of a rivulet about two miles from Linlithgow, seventeen eggs; and James D. Baillie, Esq. informed me that in June last, he took out of one which he discovered in a spruce tree near Polkemmet House, sixteen eggs. He put them in again, and, on returning sometime afterwards, found them all hatched."

"On Saturday, the 17th of June 1837," Mr Weir continues, "the following observations respecting the habits of the Wren were made in a hut formed of the branches of trees, about the distance of six feet from a nest. Shortly after I had put my finger into it, to ascertain whether or not the young were ripe, their mother arrived, and perceiving that the entrance to it had been touched, set up a doleful lamentation, carefully rounded it with her breast and wings, and with her partner commenced her natural attention to her offspring, which consisted of six young ones. Between three and four o'clock in the morning, they fed them ten times; and from four to five twenty-one times. The female now went into the nest, and remained a few minutes. From five to six o'clock, they fed their young twenty-one times; from six to seven, also twenty-one times. The female went into the nest twice, and the male sang almost incessantly during the last two hours. From seven to eight o'clock, they fed them twenty-two times; and, although they were ripe, the female sat upon them nearly ten minutes. From eight to nine o'clock, they fed them fifteen times; from nine to ten, twelve times; from ten to eleven, fourteen times; from eleven to twelve, eighteen times; and from twelve to one, fifteen times. The female went into the nest for a short time. From one to two o'clock, they fed them eleven times; from two to three, eighteen times. The female went into the nest, and remained a few minutes. From three to four o'clock, they fed them thirteen times, and from four to five, seventeen times. During the greater part of this hour, there was a heavy fall of rain, accompanied with a great deal of loud thunder. The female entered the nest, and continued

in it a quarter of an hour. From five to six o'clock they fed them fourteen times. The female went into the nest for five minutes. From six to seven o'clock, they fed them ten times; and from seven to eight, seventeen times. The female went into the nest, and remained a short time. From eight to nine o'clock, they fed them eight times; and about ten minutes after this, having again fed them, the female went into the nest and remained for the night. From the slender branch of a larch, they supplied with a great variety of flies and insects their young, whose craving appetite seemed never to be satisfied, no less than 278 times in the course of the day. As the number of insects carried in by them varied, it was impossible to calculate exactly how many were destroyed."

The following &c. p. 734.

Young.—The young in their first plumage differ considerably from the old birds. The basal margin of the bill, and the lower mandible, are yellow, the upper mandible pale brown; the feet brownish-yellow. The upper parts are reddish-brown, the head darker; the wings and tail barred with blackish; the lower parts pale yellowish-brown, the tips of the feathers darker, the lower tail-coverts slightly barred. The wing-coverts are destitute of the white tips conspicuous in old birds.

Progress toward Maturity.—After the first moult, the bill is more dusky, the feet darker; the upper parts more or less undulated; as are the abdominal feathers and sides; but the lower parts are still of a dull greyish-brown colour.

Remarks.—I have preferred retaining the specific name Troglodytes, bestowed by Linnæus, to converting it into a generic name, because the hiding in caves or holes, like the ancient Troglodytæ, is not a character common to all wrens, although it belongs to the present species in a remarkable degree. As a generic name, Anorthura, proposed by Mr Rennie, seems to me not merely unobjectionable but very appropriate.

Genus I. CERTHIA. Linn. TREE-CREEPER.

Bill rather long, very slender, subtrigonal, tapering, much compressed, arcuate, acute : upper mandible with its dorsal outline arcuate, the ridge very narrow, the sides rapidly sloping, the edges sharp, without notch ; lower mandible with the angle very narrow and sharp, the dorsal outline decurved, the ridge narrow, the sides erect, the edges sharp, the tip acute ; the gape-line arcuate.

The upper mandible concave beneath, with a central prominent line ; the lower deeply channelled. The tongue long, narrow, decurved, sagittate, tapering, its margins lacerate toward the tip, which is acute ; œsophagus of moderate width ; stomach elliptical, muscular ; intestine very short, of moderate width ; cœca very small. Plate XIV, Fig. 2.

Nostrils linear-oblong, exposed, with an oblong operculum ; the nasal depression of moderate size, feathered at the base. Eyes of moderate size ; eyelids feathered. External aperture of the ear large and roundish.

The general form is slender, although the body is very short, the wings and tail being elongated ; the neck short ; the head ovato-oblong and of moderate size ; the feet of ordinary length, the tarsus slender, compressed, anteriorly covered with seven broad scutella, of which the upper are indistinct, posteriorly edged ; toes rather large, extremely compressed ; first very large, being with its claw longer than the third, the second much shorter than the fourth, the anterior united as far as the second joint ; claws very long, arched, slender, extremely compressed, laterally grooved, very acute.

Plumage very soft, blended, and elongated, especially on the back ; the feathers ovato-oblong, with very loose barbs, and a long slender plumule of few filaments. Wing rather long, convex, much rounded ; of nineteen quills ; the first nearly half

the length of the second, the fourth longest, the fifth almost equal, the third and sixth nearly of the same length. Tail long, of twelve slightly arcuate pointed feathers, of which the shafts are rather strong, and the extremities of the webs worn.

The transition from the bill of Anorthura to that of Certhia is very direct, the latter being merely more elongated and curved. The plumage of the two genera is similar as to texture; but while the tail of the former is short and generally raised, it is in the latter elongated, and employed in supporting the bird as it ascends the trunks of trees. The toes, and especially the claws, are longer in Certhia.

The Tree-Creepers resemble the Woodpeckers in their mode of progression, which is by extremely rapid short hops or starts against the bark of trees, to which they cling with their sharp claws. Their bill however is so slender and weak that they cannot employ it in perforating the bark or decayed wood, and they are therefore content with searching the chinks for their food, which consists of small insects and larvæ. They nestle in holes, and have a rather numerous progeny.

Very few species of this genus are known, and only one occurs in Britain, the history of which will afford a good idea of the habits of the rest.

1. CERTHIA FAMILIARIS. THE BROWN TREE-CREEPER.

CREEPER. TREE-SPEELER. BROWN WOODPECKER. SNAIGEAR. MEANGLAN-STREAPACH.



Fig. 189.

Certhia familiaris. Linn. Syst. Nat. I. 184.
Certhia familiaris. Lath. Ind. Orn. I. 280.
Common Creeper. Mont. Orn. Dict.
Le Grimpereau. Certhia familiaris. Temm. Man. d'Orn. I. 410.
Common Creeper. Certhia familiaris. Selb. Illustr. I. 388.
Certhia familiaris. Common Creeper. Jen. Brit. Vert. An. 152.

Upper part of the head dark-brown, neck and back yellowish-brown, each feather with a median whitish streak; rump yellowish-red; wings with a transverse whitish band; lower parts silvery.

Male.—The Tree-creeper, which is one of the smallest of our native birds, weighing only about two drams, is of a slender elongated form, with the neck short, the head ovato-oblong, and of moderate size. The bill is nearly as long as the head, arcuate, somewhat triangular at the base, much compressed toward the end, both mandibles acute, with the edges sharp, and the upper destitute of notch. The tongue is slender, sagittate and papillate at the base, horny toward the end, concave above, pointed and bristly. The œsophagus is narrow, without dilatation, an inch and nine-twelfths in length; the stomach elliptical, com-

pressed, five-twelfths of an inch long, its muscles of moderate strength; the intestine five inches long, with very small cylindrical cœca, half a twelfth in length, and a quarter of a twelfth in breadth. See Plate XIV, Fig. 2. The feet are of moderate length and slender; the tarsus compressed, with seven anterior scutella; the hind toe large, with ten scutella, the second with eight, the third ten, the fourth twelve; the anterior toes parallel and united as far as the second joint; the claws very long, moderately arched, extremely compressed, and very acute; that of the hind toe extending beyond the claw of the third. The mobility of the toes is very extraordinary: the hind toe may be turned outwards until it forms a right angle with its ordinary direction, and all the other toes may be so twisted as to reverse the position of the claws. Fig. 190.

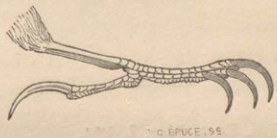


Fig. 190.

The plumage is full, very soft, and blended, on the back much elongated, with the barbs separated, the feathers there being an inch long, and thus greatly exceeding the diameter of the body. There are no bristle-feathers at the base of the bill. The wings, Fig. 191, are of moderate length, concave, with nineteen

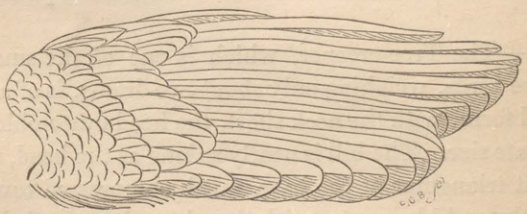


Fig. 191.

quills, of which the outer is scarcely half as long as the second, which is four-twelfths of an inch shorter than the third; the fourth, which is the longest, exceeds the fifth only by half a

twelfth, and the third by one twelfth, while the second and eighth are nearly equal. The tail is long, arched, much rounded at the end, of twelve stiff-shafted acuminate feathers, of which the lateral is eight-twelfths shorter than the middle. Fig. 192.

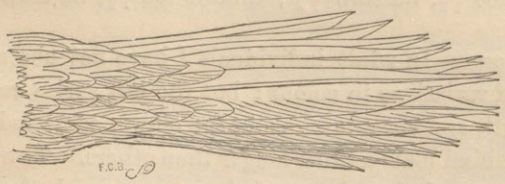


Fig. 192.

The upper mandible and the extremity of the lower are dusky-brown, the basal portion of the latter whitish; the irides hazel; the feet pale flesh-colour tinged with brown, the claws light yellowish-grey. The upper part of the head is dark-brown, with linear-oblong brownish-white streaks; the rest of the upper parts light brown, with similar streaks, the feathers on the rump becoming dull yellowish-brown. The small wing-coverts are variegated with dusky, light brown, and brownish-white; the primary coverts blackish-brown, with a whitish spot at the tip; the secondary coverts lighter, with a larger whitish spot at the end, but only on the outer web. The quills are dusky, but the inner pale greyish-brown on the inner web, dusky on part of the outer; all except the outer three have a whitish spot at the end; the wing is crossed by a band of pale brownish-yellow, which, however, does not include the outer three quills or the inner three secondaries; the outer webs of most of the quills are light yellowish-grey toward the end. The tail is light yellowish-grey, the inner webs dusky, the shafts yellowish-brown. A white streak extends over the eye, and the lower parts are of a dull but glistening silvery white. The concealed part of the plumage is greyish-black.

Length to end of tail $5\frac{5}{12}$ inches; extent of wings 8; bill along the ridge $\frac{7}{12}$, along the edge of lower mandible $\frac{8\frac{1}{2}}{12}$; wing from flexure $2\frac{7}{12}$; tail $2\frac{6}{12}$; tarsus $\frac{7\frac{1}{2}}{12}$; first toe $\frac{4}{12}$, its claw $\frac{5\frac{1}{2}}{12}$; second toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; third toe $\frac{5\frac{1}{2}}{12}$, its claw $\frac{4}{12}$; fourth toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{4}{12}$.

Female.—The female is similar to the male, but somewhat less, and having the colours of the upper parts paler.

Length to end of tail $5\frac{2}{12}$ inches; extent of wings $7\frac{1}{2}$; bill along the ridge $6\frac{1}{4}$; wing from flexure $2\frac{5}{12}$; tail $2\frac{4}{12}$; tarsus $\frac{7\frac{1}{2}}{12}$; hind toe $\frac{4}{12}$, its claw $\frac{5}{12}$; middle toe $\frac{5}{12}$, its claw $\frac{4}{12}$.

Variations.—In adult individuals I have not observed any remarkable variations in colour; but the bill varies considerably in length and curvature, as do the claws, some individuals having the hind claw a third longer than others. Towards the end of summer, before the moult has commenced, the colours are usually much faded. The tint of the lower parts varies, being often much soiled with matters rubbed from the trees.

Habits.—On the 4th December 1816, while on an excursion in quest of zoological subjects, I happened to stroll into a fir wood, about four miles distant from my residence in the Old Town of Aberdeen, and, being a novice, was quite astonished at seeing a swarm of extremely small birds of different species, moving about among the twigs, and apparently searching for food with incessant activity. Having succeeded in shooting two of them, I found them to belong to the genus Motacilla, and the species Regulus; but being persuaded that I had seen other small birds in the flock, I returned next day, and procured six Reguli, five specimens of Parus ater, a Motacilla Troglodytes, and a Certhia familiaris. Such was the nomenclature in those days, but now the names of only two of these birds remain as they were. The pleasure which I experienced must have been greater than that which the sight of a flock of these tiny and most interesting creatures could now impart; but still it affords no slight gratification to watch the motions of these wanderers of the wild woods, so intent on their search for food that they take little heed of the near approach of one who may be bent on thinning their swarms.

At this season, should you fall in with a flock of Reguli and Pari, scouring a wood, you may be pretty well assured that a few Tree-creepers will be found at no great distance. There, clinging to the rough bark at the base of that old elm, you see

one, advancing upwards by short jerks. At each movement it emits a shrill but feeble cry. See how it climbs, searching every crevice, now proceeding directly upwards, now winding round the trunk, presently passing behind it, and in a short time appearing on the other side. Observe it well, and you will see that it crouches close to the surface, presses its tail against it, now and then picks something from a cleft, jerks itself forwards, never rests for a moment, but seems in utmost haste, and expresses its anxiety by continually emitting its lisping cry. Yet its efforts are not laborious: it seems to hold on with perfect ease and unconcern, and although it is now half way up, it exhibits no sign of fatigue. There, it passes off from the trunk, creeps along a nearly horizontal branch, winding round it, adhering even to its lower surface, with its back toward the ground. Having gone as far as it finds convenient, it flies back to the trunk, which it ascends, until you lose sight of it among the twigs at the top. What next? will it creep down again? No; there it comes with headlong flight, glancing like an arrow, curves as it comes near the ground, alights at the very root of the next tree, and commences its ascent. You may watch it for an hour, and you will find it as fresh, as lively, and as keen as ever. Should it happen to observe you, and suspect that you mean it no good, it will run up the back of the tree, appearing now and then at the sides, until it is perhaps half way up, when it will search all parts alike, being free of the apprehension of injury. But now, hearing its friends the Tits and Reguli at a distance, it looks abroad for a moment from the top of the tree, and uttering a few cries, sweeps away in a curving, somewhat undulatory course.

Such, in fact, is the ordinary course of action of the Creeper, which is thus of very peculiar and remarkable habits. It alights at the bottom of a tree, clinging to the bark with its claws, and without a moment's delay begins to ascend, which it does by short starts, leaping forward as it were, and supporting itself by pressing the tail against the bark. In this manner it proceeds, diligently searching for insects, which it picks out with the greatest dexterity. Should a person, curious to observe its motions, go very near, it winds round so as to

keep on the further side of the tree, but seldom flies off. Should it meet with a horizontal branch, it can easily proceed along its lower surface, although in that case it usually prefers the sides or upper part. When it has searched the branch, it flies off to another, or continues to ascend the stem; and when it has attained the higher branches, it flies off to the base of a neighbouring tree, and thus proceeds unceasingly. Indeed I have seldom observed one a single minute at rest. Yet, like other birds, it has its periods of cessation from labour, and in the breeding season it is amusing to observe the gambols of a pair, which may be seen chasing each other along the trunk of a tree, perching for a moment on the branches, and then scudding along, all the while emitting their shrill and feeble cries.

These birds are easily shot, for, like the Gold-crested Kinglet and Coal Tit, they seem to pay little attention to a person approaching them, insomuch that I have been within six feet of one, which yet did not fly off, but merely crept round to the other side of the tree. While thus employed, it utters every now and then a very low cheep, and when flying from one tree to another, repeats this cry more frequently, and somewhat more loudly. I suppose that it is destitute of song, never having heard it emit modulated sounds. Its flight is generally short and rapid, from the top of one tree to the base of another; but it may sometimes be seen traversing a space of several hundred yards, which it does with a quick and undulatory motion, at a considerable elevation.

It is a permanent resident, occurs in all the wooded parts of the country, but is nowhere numerous, and never appears in flocks. In winter it shifts about from place to place, generally accompanying a flock of Tits or Kinglets, but sometimes seeking for its food solitarily, seldom entering small gardens, but often appearing in woods near houses, hedgerows, or even on large single trees. It pairs in April, and about the beginning of May begins to construct its nest, which it places in some hole in a tree, or rock, or among the roots in a mossy bank. It is composed of withered stalks and blades of grasses, moss, fibrous roots, and other materials, and is lined with feathers.^ The eggs, from five to seven or eight in number, are seven and a

^ One sent to me from Dunkeld by Dr. Robertson, measure generally two inches and a half, externally four inches. It is composed of blades of grass moss, deer's hair, and fibres of bar The lining is thick, well felted, and composed of deer's hair mixed with a great quantity of down, apparently of the h some soft light coloured fibres, and lastly long hairs, and fea of the wood pigeon.

half twelfths of an inch in length, five-twelfths in breadth, of a regular ovate form, glossy, white, sprinkled with dots and small patches of brownish-red, often disposed in a broad belt near the larger end, and leaving the narrower half unspotted. Montagu states that "during the time of incubation, the female is fed by the other sex, whenever she quits her nest in search of food." The young are abroad by the middle of June, and I have reason to think that a second brood is frequently reared.

Although the epithet *familiar* has been given to this little bird, it cannot be said to deserve it, for its seeming familiarity results merely from its close attention to the objects of its search, and the moment it becomes sensible of the proximity of a person it glides out of his sight. Of all our native birds, the Robin is that which reposes most confidence in man. It will often stand, looking at him, until he approaches within two or three yards, and even then exhibit little alarm; nay, it will sometimes enter his dwelling, and seem quite at home there. But the Creeper is in no sense a familiar bird.

This species is generally distributed over Europe, as well as North America. I have compared specimens from both continents, and found them in all respects similar; Mr Audubon is of the same opinion; yet the Prince of Musignano, without assigning a reason, or giving distinctive characters, chooses to consider the American bird as a species different from the European.

Young.—The young when fledged are similar to their parents, but with the feathers more loose, and the colours duller.

Genus II UPUPA. Linn. HOOPOE.

Bill longer than the head, slightly arcuate, very slender, compressed, angular, pentagonal at the base, four-sided toward the end, the point sharp, or somewhat blunted from use; upper mandible with its dorsal line slightly arcuate, the ridge very narrow, the sides sloping and flattened, the edges sharp, without notch, the tip flattened, rather acute; lower mandible with the angle rather long and narrow, the dorsal line slightly decurved, the ridge sharp, the sides at the base erect and flat, toward the end inclining outwards, the edges sharp, the tip acute, the gape-line slightly arcuate. Fig. 193.

The mouth of moderate width; the palate convex, the upper mandible very slightly concave beneath, the lower almost flat. Tongue very short, fleshy, flattened, as in Alcedo. Nostrils oblong, basal. Eyes of moderate size.

The general form is rather slender; the body ovate; the neck of moderate length; the head ovato-oblong, rather small. The feet very short, and of moderate strength; tarsus very short, roundish, with seven anterior broad scutella, somewhat sharp behind, with two rows of scales; toes moderate, compressed; the first with its claw longer than the tarsus and nearly equal to the middle toe, the outer adnate at the base, and somewhat longer than the inner. Claws of moderate length, stout, that of the hind toe slightly arched, compressed, with the tip acute and abruptly deflected; the rest well arched, compressed, very acute, all laterally grooved. Fig. 194.

The plumage soft and blended, the feathers elliptical, without plumule; those on the top of the head oblong, much elongated, forming a large crest; no bristle-feathers at the base of the bill. Wings rather long, very broad, much rounded; the first quill about half the length of the fourth, which is longest; the quills nineteen, all rounded. Tail nearly even, of ten rounded soft feathers.

Linn.

1. UPUPA EPOPS. THE EUROPEAN HOOPOE.

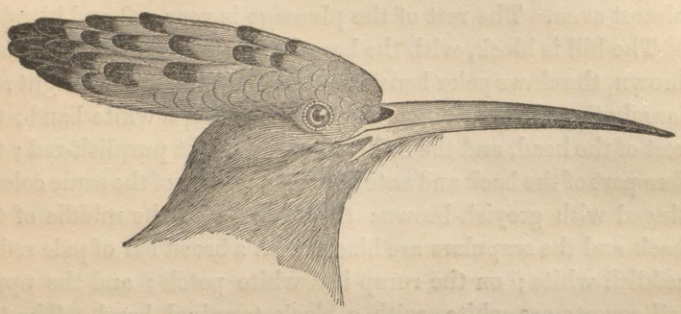


Fig. 193.

Upupa Epops. Linn. Syst. Nat. I. 183.
Upupa Epops. Lath. Ind. Orn. I. 277.
Hoopoe. Mont. Orn. Dict.
La Huppe. Upupa Epops. Temm. Man. d'Orn. I. 415.
Hoopoe. Upupa Epops. Selb. Illustr. I. 393.
Upupa Epops. Hoopoe. Jen. Brit. Vert. An. 153.

Head and neck light red, crest-feathers tipped with black; fore part of back light purplish-red, middle part barred with black and reddish-white, rump white, tail-coverts black, barred with white; wings and tail black, the former with several, the latter with a single band of white.

Male.—This elegant bird, which is an irregular visitant in Britain, is about the size of a Missel Thrush, but of a more slender form, with an elongated attenuated bill, and very short feet. Not having met with it alive, or obtained a recent specimen for dissection, I can only describe it from skins. The generic description already given, will be found to agree with it in every particular, so that here there is only to be added what belongs to the species. The elongated feathers on the head are disposed in several series on each side, the largest

being about two inches in length, and are capable of being erected from their ordinary position, in which they are recumbent. The first quill is an inch and five-twelfths shorter than the second, which is seven-twelfths shorter than the third, the fourth a twelfth and a half longer, being the longest; the secondary quills are very long, broad, and rounded; the tail is almost even. The rest of the plumage is very soft and blended.

The bill is black, with the base flesh-coloured; the feet dusky brown, the claws paler beneath. The crest-feathers are light red, largely tipped with bluish-black, succeeding a white band; the rest of the head, and the neck all round, light purplish-red; the fore part of the back and anterior wing-coverts of the same colour, tinged with greyish-brown; the feathers on the middle of the back and the scapulars are black, with a broad bar of pale red or reddish-white; on the rump is a white patch; and the upper tail-coverts are white, with a black terminal band. The tail is black, with a broad band of white disposed in the form of a crescent, its distance from the tip of the middle feathers being an inch and a half, from that of the lateral feathers scarcely half an inch, the outer feather on each side with an additional white band toward the base; the smaller wing-coverts are black, with a white band; the larger also black, the primary without white markings, the secondary with two bands of reddish-white; the primary quills are glossy bluish-black, with a broad band of white toward the end, the band of the first being only on the inner web; the secondary quills gradually become tinged with brown, and assume two additional bands of white, tinged with red on the inner, which are margined with pale red. The light-red of the fore-neck becomes paler on the breast; some of the feathers on the sides are streaked with dusky; and the abdomen and lower tail-coverts are white.

Length to end of tail 12 inches; bill along the ridge $2\frac{1}{4}$; wing from flexure $5\frac{5}{12}$; tail $4\frac{2}{12}$; tarsus $\frac{10}{12}$; hind toe $\frac{5\frac{1}{2}}{12}$, its claw $\frac{4\frac{1}{2}}{12}$; second toe $\frac{5\frac{1}{2}}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; third toe $\frac{8}{12}$, its claw $\frac{4\frac{1}{2}}{12}$; fourth toe $\frac{7}{12}$, its claw $\frac{5}{12}$.

Female.—The female is similar to the male, differing only in having the bill and crest shorter, and the plumage paler.

Habits.—The Hoopoe has been met with in most parts of England, as well as in several districts in Scotland, even as far north as Caithness and Orkney, although not on the western coast beyond the Frith of Clyde. It is not however a regular summer visitant, but makes its appearance here and there unexpectedly, more frequently in autumn than in summer, and in the latter case seldom breeding. On the continent it appears to be generally distributed, arriving in the beginning of summer, and departing in small flocks in September. The form of its tarsi and claws would lead us to suppose it to be a climbing or creeping bird; but although it resides chiefly in woods, it is said also to betake itself to the fields in their vicinity, and to walk about in search of its food, which consists of insects and larvæ. Its very short tarsi however are obviously not well adapted for walking, and were its habits for the most part terrestrial, its claws could not fail to be in some measure blunted, whereas they are remarkably acute in all the specimens that I have examined. Ploughed land, pasture-ground interspersed with cow-dung, sandy soil, and muddy places by streams, are said to be its favourite haunts. It breeds in hollow trees, forming its nest, according to some, of dry cow-dung and roots, or, according to others, of decayed wood, or of grass and feathers. The eggs are said to be from two to five, a little more than an inch in length, and of a uniform light grey or bluish-white. It appears that the excrements of the young are allowed to remain in the nest, which accordingly is described as having an extremely fetid odour, similar to that of the Kingsfisher, which the Hoopoe further resembles in the construction of the bill, and especially in the form of the tongue. The shortness of the latter organ however does not render necessary a diet of fish or frogs, as some have supposed, for Ibises and other birds having equally short tongues can pick up small insects and larvæ with ease.

This bird has been named Hoopoe from the crest or tuft, *huppe* in French, with which its head is adorned. Some however derive its name from its ordinary cry, which is said to resemble *up-up*, or *pu-pu*. It is said to be shy, although it allows one to approach within shot, and, when obtained young, to be

easily reared on flesh, which however, Bechstein remarks, it cannot pick up well, because the tongue is too short to turn the food into the throat, so that it is obliged to throw it up into the air, and receive it with open bill. The same author, in his "Cage Birds," states that, independently of its beauty, it is attractive by the drollness of its actions, making a continual motion with its head, and tapping the floor with its beak. M. Von Schauroth, in a letter addressed to M. Bechstein, gives an account of two young Hoopoes, which he took from a nest placed at the top of an oak. They were exceedingly tame, climbed on his clothes until they reached his shoulders or head, and caressed him very affectionately. They were fond of beetles and May-bugs, which they first killed, and then beat them into a ball, which they threw into the air, and caught lengthwise.

It does not appear that the peculiar habits of this bird have been well described, for the brief notices given in books are not sufficient to enable us to ascertain its character. In external form it is very nearly allied to the Wall-Creeper, Tichodroma muraria, and for that reason chiefly I have placed it in the family of Certhianæ; but if not intimately allied to the Alcedinæ, it certainly indicates a transition to them.

An individual of this species was shot near Edinburgh in the autumn of 1832, and Mr Binnie, farmer at Avon Bank, about a mile and a half from Linlithgow, states that in 1835, one was seen in his neighbourhood for seven or eight weeks, residing chiefly in Kinneil Wood, but occasionally coming very near his house.

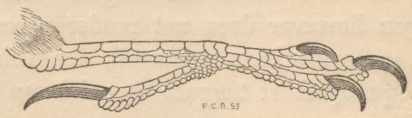


Fig. 194.

Family II. SITTINÆ. Sittine Birds.

NUTHATCHES AND ALLIED SPECIES.

The birds of this family are of small size, the largest not exceeding a domestic Sparrow, and agree in having the body short and compact, the neck short, the head of moderate size, or rather large; the bill shorter than the head, sometimes almost as long, straight, or even slightly bent upwards, slender, pentagonal at the base, four-sided toward the end, with the tip acute, or somewhat cuneate. The tongue is slender, very thin, with the point abrupt, and furnished with several bristles; the œsophagus rather wide, tapering, without crop; the proventriculus oblong; the stomach rather large, broadly elliptical or roundish, muscular, with a dense rugous epithelium; the intestine rather short and wide; the cœca very small. Plate XIV, Fig. 3.

The plumage is very soft, full, and blended; the wings long, very broad, with the first quill very small, but the second not much shorter than the third and fourth, which are generally longest; the tail short, broad, and soft. The tarsi are short, or of moderate length, and slender; the toes long, slender, compressed, the anterior coherent at the base, the inner much shorter than the outer, the hind toe elongated; the claws long, well arched, compressed, acute.

In the form of the feet and claws the Sittinæ resemble the Certhiinæ, while in the structure of the bill they are allied to the Woodpeckers, and in their aspect and colouring exhibit an affinity to the Tits. Their habits accordingly present a combination of those of all these birds. Of the few genera forming this family, only one occurs in Europe.

Genus I. SITTA. NUTHATCH.

Bill of moderate length, straight, slender but strong, somewhat conical, slightly higher than broad, pentagonal at the base, four-sided toward the end, with the point sharp, or somewhat wedge-shaped from use; upper mandible with its dorsal outline very slightly arcuato-declinate or nearly straight, the ridge rather obtuse, the sides sloping, a little convex toward the end, the edges sharp, sloping outwards and overlapping, the point narrow, acute, or blunted, somewhat depressed, without notch or sinus; lower mandible with the angle rather short and of moderate width, the dorsal outline ascending and slightly convex, the sides sloping outwards and flat at the base, convex towards the end, the edges thin and directed outwards, the tip acute; the gape-line straight.

The mouth narrow; the upper mandible slightly concave internally, with three parallel central prominent lines, and two lateral grooves; the lower moderately concave, with a strong central prominent line. Nostrils oblong, in the fore-part of the short nasal membrane, which is feathered. Eyes rather small; eyelids feathered. External aperture of ear large and roundish.

The general form is short and robust; the body and neck very short; the head ovate, rather large. The feet rather short and strong; tarsus very short, compressed, with seven very broad anterior scutella, sharp behind; toes large, much compressed; the first, with its claw, longer than the tarsus or the middle toe, the three anterior united at the base as far as the second joint, the fourth longer than the second. Claws long, much arched, extremely compressed, high, laterally grooved, very acute.

The plumage soft and blended, the feathers ovate, those of the back elongated, about the base of the bill short and bristle-tipped; but there are no bristle-feathers. Wings long, very broad, rounded; quills nineteen; the first very small, being

scarcely a third of the length of the second, the fourth longest, but the third and fifth almost equal; the third, fourth, fifth, and sixth cut out on the outer web; the secondaries long and rounded. Tail short, generally even, of twelve moderately broad, weak, rounded feathers.

The genus Sitta is composed of small birds, varying in size from that of a Coal Tit or Regulus to the length of six or seven inches. They inhabit the warmer and temperate parts of both continents, but are more numerous in America, only one species occurring in Europe. In the form of their bill, in that of their feet, but more especially in their general appearance, and in their colouring, as well as in their habits, they present a considerable affinity to the Tits, between which, on the one hand, and the Creepers and Woodpeckers on the other, seems to be their station in a natural arrangement.

The Nuthatches, according to the observation of persons who have studied their habits, are remarkable for restless activity, move with extreme quickness up and down the branches and trunks of trees, searching for insects in the crevices of the bark and among the leaves, cling and hang to the twigs, turning with astonishing agility in all directions, utter every now and then a loud shrill note, fly from tree to tree in the woods, visit the gardens occasionally, and associate with Creepers, Tits, and small Woodpeckers. Their flight is rapid, generally short, but sometimes protracted; their food consists of insects, pupæ, and larvæ of various kinds, as well as of acorns, chestnuts, and other hard fruits, which they split or perforate with their bill, after fastening them in a crevice. Not unfrequently they betake themselves to the ground in search of food, and come into the immediate vicinity of houses in winter. They nestle in holes, generally formed by themselves in decayed trees. They have the singular habit of sleeping with their head downwards, as they cling to the surface of a tree, and, unlike the Creepers, which can only ascend, they are equally expert at descending a trunk or branch; nor do they require to aid their ascent by pressing their tail against the surface.

Linn.

1. SITTA EUROPÆA. THE EUROPEAN NUTHATCH.

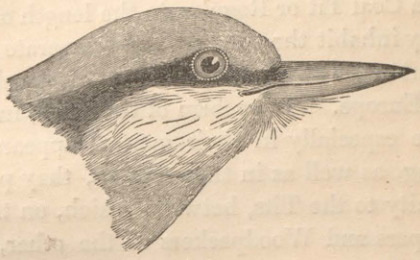


Fig. 195.

Sitta europæa. Linn. Syst. Nat. I. 177.
Sitta europæa. Lath. Ind. Orn. II. 261.
European Nuthatch. Mont. Orn. Dict.
Sittelle Torchepot. Sitta europæa. Temm. Man. d'Orn. I. 407.
Sitta europæa. Nuthatch. Jen. Brit. Vert. An. 154.
Nuthatch. Sitta europæa. Selb. Illustr. I. 385.

Upper parts bluish-grey; throat and cheeks white; loral space and a band behind the eye black; lower parts light reddish-yellow, sides brownish-red.

Male.—This beautiful and lively little bird, which occurs in various parts of England, remaining all the year, is one of the largest species of the genus. Its general appearance may be learned from the generic character, which applies to it in every respect; the body being short and rather full, the neck very short, the head rather large; the bill longish, moderately stout, straight, tapering, and towards the end four-sided; the tarsi very short, the hind toe very long, with eight scutella, the second with eight, the third with twelve, the fourth, which is considerably longer than the second, with ten; the claws long, much arched, that of the hind toe very large and curved in a semicircle.

The plumage is very soft and blended. The wings rather long, with nineteen quills, the first about a third of the length of the second, which is four-twelfths of an inch shorter than the third, the fourth longest, but scarcely exceeding the third and fifth. The tail is short, broad, straight, even, of twelve moderately broad, rounded feathers.

The upper mandible is internally almost flat, with a median ridge; the lower somewhat more concave. The tongue is nearly half an inch in length, emarginate and papillate at the base, slender, thin, with the point abrupt and furnished with strong bristles, like that of a Tit. The œsophagus is two inches and a quarter in length, rather wide, its diameter being two and a half twelfths; the stomach large, roundish, ten-twelfths in length, seven-twelfths and three fourths in breadth, very muscular, with the epithelium dense and longitudinally rugous; the intestine nine inches long, wide, having a diameter of from two and a half to one and a half twelfths; the cœca extremely small, being scarcely one-twelfth long, and of an oblong form; the rectum one inch long, dilated into an oblong sac. The tongue and digestive organs are thus similar to those of the Tits. The trachea is an inch and eight-twelfths long, one-twelfth in breadth, of seventy-six rings; the bronchi of fifteen rings; the inferior laryngeal muscles forming a small knob, and apparently single. Pl. XIV, Fig. 3.

The upper mandible is greyish-blue at the base, dusky in the rest of its extent; the lower pale grey, with the tip dusky. The iris is brown. The feet are greyish-yellow. The upper parts of the plumage are light bluish-grey. The quills and coverts are greyish-brown, margined with the same colour as the back, the primaries more narrowly, excepting the outer two, which have no coloured margins. The two middle feathers of the tail are bluish-grey, the rest dusky brown, and tipped with grey, diminishing from the outer inwards, the outer with a white spot on each web, the next two with one on the inner web only. There is a brownish-black band on the lore, and another proceeds from the eye down the neck. The cheeks and throat are white, the rest of the lower parts light reddish-yellow, excepting the sides, which are of a rich

brownish-red, and the lower tail-coverts, which are white, with a broad edging of brownish-red.

Length to end of tail $5\frac{8}{12}$ inches; extent of wings $10\frac{1}{4}$; wing from flexure $3\frac{4}{12}$; tail $1\frac{9}{12}$; bill along the ridge $\frac{9}{12}$, along the edge of lower mandible $\frac{11}{12}$; tarsus $\frac{9\frac{1}{2}}{12}$; hind toe $\frac{5}{12}$, its claw $\frac{5\frac{1}{2}}{12}$; second toe $\frac{4\frac{1}{2}}{12}$; its claw $\frac{4\frac{1}{2}}{12}$; third toe $\frac{7\frac{1}{2}}{12}$, its claw $\frac{4\frac{1}{2}}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{4\frac{1}{2}}{12}$.

Female.—The female is similar to the male, but with the tints paler, and the size somewhat less.

Variations.—This bird is very little subject to change of colour. An individual almost white, with only a few light chocolate feathers at the vent, and here and there a dark feather intermixed with the rest of the plumage, the legs and bill quite white, is mentioned in Mr Loudon's Magazine, Vol. VIII, p. 112, as having been obtained in Suffolk.

Habits.—The Nuthatch is not generally distributed in Britain, being of rare occurrence in the northern parts of England, and not hitherto observed in Scotland. It is found chiefly in the wooded parts, but is nowhere very common, and is seldom seen in companies of more than seven or eight individuals. Like the Creeper and Woodpeckers, it ascends the trunks and branches of trees by means of its long curved claws, but without employing its tail as a support, and it descends in the same manner head-foremost, in which respect it differs from all the birds that occur in our island. In this manner it searches the bark for insects and larvæ, sometimes betakes itself for the same purpose to thatched roofs, and occasionally alights on the ground, where it proceeds by short leaps. Besides insects, it feeds on the kernels of nuts, which, having fixed in a convenient crevice in the bark, it hammers with its strong pointed bill, until it perforates the shell, pivoting itself on its legs, and jerking its whole body forwards. All its actions are abrupt and lively; it climbs by short jerks, perches with ease on the twigs, throws itself into various postures, and is often seen with its head down-

wards, in which position it is even said at times to sleep. Its flight is rapid, protracted on occasion, but usually short. It has no song, being furnished with only a single pair of inferior laryngeal muscles, but utters a shrill cry at intervals.

My excellent friend, Mr Harley, writes me on the subject of the Nuthatch as follows:—"This bird remains with us throughout the year, inhabiting the park and old inclosure more than the hedge-row tree or the dense umbrageous wood. In fact, I have never seen it upon our hedge-row trees, although I have often sought for it when I have been watching the haunts of the Woodpeckers, which so much resemble it in their habits. In winter it is not quite mute, but has a small piping note, not unlike that of the Creeper. This is a call-company note, inasmuch as the Nuthatch in winter feeds in little companies or families of four or six individuals. On the 21st November (1839) I went after a pair of the Greater Spotted Woodpecker and a pair of Nuthatches, in Ganendon Park (near Leicester), the weather being mild, but gloomy, and the wind south. It was not without difficulty that I found the Nuthatches, which invariably feed where the trees are most protected from the wind. Thus, when the south or forest wind is playing upon the park, the Nuthatches are to be found amongst the large oaks and elms on the north side of it; and when a north-easter is blowing, these birds are found feeding on the beeches, chestnuts, and pines which grow on the south side. I know of no birds whose habits and manners are so operated upon by the movements of the wind. Whether this arises from their being so much exposed to the weather, in consequence of their being almost constantly on the bark of trees at all seasons of the year, I cannot say. The Nuthatch searches the bark like the Creeper, but without deriving aid from its tail, and is able to descend with as much ease as it climbs. You see it now ascending spirally the bole of an oak, then creeping horizontally along an arm, now above, now beneath, and again hanging like a Tit, as it gains the thickened foliage, to examine every crevice of the bark, and the young buds. It proceeds by short leaps, jerks, or notches, and during its progress droops its wings somewhat after the manner of the Hedge Sparrow. At this season (No-

vember) it generally keeps toward the middle and topmost branches of the trees it inhabits; but as the spring advances it not only feeds lower down on the bark, but may then be observed occasionally betaking itself to the ground. The note in spring is quite different, having in the vernal months a soft flute-like sound, which it gets in February, but somewhat earlier or later according to the nature of the season. The flight of the Nuthatch is very short, and in fact is only made from one tree to another, or from branch to branch. When the bird is flying, it moves its wings very rapidly, and, during these short flights, its course is not undulating. In its mode of flying it bears a great resemblance to the Wren. The pair which I have forwarded for your inspection were shot from the bark of an oak. You may fire several times into the same tree, without causing the birds, which at this season are in families, to leave it, although one or two should be killed. When these two were obtained, four shots were fired, and yet all this cannonading did not drive off the other four birds, which remained until we departed."

In the stomach of these individuals I found fragments of small coleoptera, several small white pupæ contained in very hard elliptical shells, some farinaceous-looking matter in small pieces or chips, a few husks of grasses, and several particles of quartz, the largest two-twelfths in their greatest diameter. The figure and description of the alimentary canal is taken from one of these specimens, a male, as are the measurements of the bill, feet, and other parts.

The Rev. W. T. Bree, in Loudon's Magazine, Vol. II, p. 243, states that "it fixes the nuts in a chink or crevice of the bark of a tree, or the like, and commences a vigorous attack upon the shell by forcibly and repeatedly striking it with its beak. This knocking may be heard to a considerable distance. During the operation, it sometimes happens that the nut swerves from its fixture, and falls towards the ground; it has not descended, however, for the space of more than a few yards, when the Nuthatch, with admirable adroitness, recovers it in its fall, and replacing it in its former position, commences the attack afresh. The fall of the nut in the air, and its recovery by the

bird on the wing, I have seen repeated several times in the space of a few minutes."

A correspondent, J. D., in the same very useful work, Vol. V, p. 489, has the following notice. "In observing the Nuthatch climbing tall trees, as the lime and the elm, when, of course, insects, not nuts, were the objects sought, I noticed that the bird ascended in a very zigzag manner, as, at the end of every few inches of its progress upwards, it diverged either to the right hand or to the left; this, it may be presumed, was less for the purpose of rendering ascent easy, than for that of enlarging its field of search, and so increasing the chances of amplifying its meal. During the winter the Nuthatch was very shy, and as far as my observation went, quite silent. By the 10th of April and before, it had become, I think, less shy, and rather frequently uttered one or the other of its two notes: these are a short broken twitting, and a short, unmodulated, yet mellow-toned whistle." Another correspondent states that it "has only a few short notes, one of them peculiar, and so loud that it may be heard to a considerable distance. It is at all times a busy and cheerful bird, and particularly before breeding time. Its favourite food is nuts of any kind, and tree seeds. It builds and roosts in hollow trees, and is seldom seen in the open fields, unless when in quest of the stones of white-thorn. It may be, therefore, properly called a forester. Its dexterity in opening nuts and the stones of fruits is curious; it fixes the nut in a crack on the top of a post, or on the bark of a tree, and, placing itself above it, head downwards, strikes with great force and rapidity with its strong wedge-shaped bill on the edge of the shell till it splits it open. When the food of these birds is plentiful, they have a favourite crack for unshelling the kernels, as sometimes a peck of broken shells may be seen under this crack."

According to Montagu, "it chooses the deserted habitation of a Woodpecker in some tree for the place of its nidification. This hole is first contracted by a plaster of clay, leaving only sufficient room for itself to pass in and out. The nest is made of dead leaves, most times that of the oak, which are heaped together without much order. The eggs are six or seven in

number, white, spotted with rust colour, so exactly like those of the Great Titmouse in size and markings, that it is impossible to distinguish a difference. If the barrier of plaster at the entrance is destroyed when they have eggs, it is speedily replaced; a peculiar instinct to prevent their nest being destroyed by the Woodpecker and other birds of superior size who build in the same situation. No persecution will force this little bird from its habitation when sitting; it defends its nest to the last extremity, strikes the invader with its bill and wings, and makes a hissing noise; and, after every effort of defence, will suffer itself to be taken in the hand rather than quit."

Like the American species, it appears from the testimony of several writers, that the European Nuthatch sometimes makes a hole for itself; and it would seem that the plaster is only used when the entrance is unnecessarily large. Mr Harley informs me that he has known it to nestle in a gate-post, and keep its station although the gateway was often used. In Ganendon Park, where it is pretty common, it nestles in elm, thorn, and maple trees.

In a state of captivity the Nuthatch is fed on hemp-seed, oats, barley, and nuts, all of which it cracks or splits with its bill. Its activity, cunning, and drollery, render it an agreeable pet, but it must be kept in a cage entirely of wire, as it destroys wood with its bill. Bechstein, in his Cage Birds, relates an instance of its familiarity. "A lady amused herself in winter with throwing seeds on the terrace below the window, to feed the birds in the neighbourhood. She put some hemp-seed and cracked nuts even on the window-sill, and on a board, particularly for her favourites, the Blue Tits. Two Nuthatches came one day to have their share in this repast, and were so well pleased that they became quite familiar, and did not even go away in the following spring, to get their natural food and to build their nest in the wood. They settled themselves in the hollow of an old tree near the house. As soon as the two young ones, which they reared here, were able to fly, they brought them to the hospitable window where they were to be nourished, and soon after disappeared entirely. It was amusing to see these two new visitors hang or climb on the walls

or blinds, whilst their benefactress put their food on the board. These pretty creatures, as well as the tits, knew her so well, that when she drove away the sparrows which came to steal what was not intended for them, they did not fly away also, but seemed to know that what was done was only to protect and defend them. They remained near the house for the whole summer, rarely wandering, till one fatal day, at the beginning of the sporting season, in autumn, when on hearing the report of a gun they disappeared, and were never seen again."

Young.—The young when fledged differ from the adult in having the colours paler and the plumage more loose.

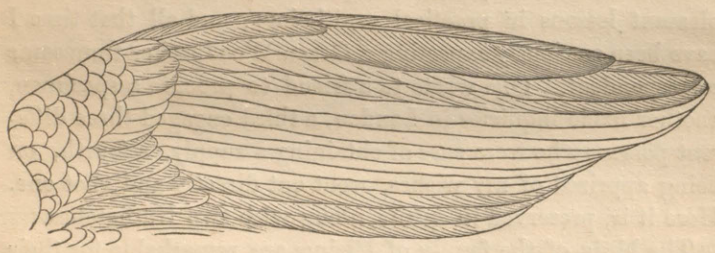


Fig. 196.

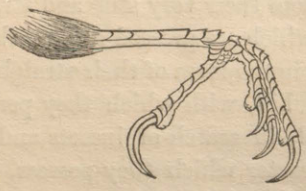


Fig. 197.

Order V. Scansoriæ. p. 65.

PRACTICAL ORNITHOLOGY.

SEVENTH LESSON.

REMARKS ON WOODPECKERS. STRUCTURE OF THE TONGUE OF PICUS VIRIDIS, AND EXPLANATION OF THE MANNER IN WHICH IT IS EXTENDED AND RETRACTED. ITS TRACHEA AND DIGESTIVE ORGANS. DESCRIPTION OF PART OF THE COUNTY OF LEICESTER, INCLUDING CHARNWOOD FOREST.

More than half a year has elapsed since we had one of our pleasant lessons in practical ornithology, and all that time I have been anxiously expecting a Green Woodpecker from some correspondent. One wrote to a friend to procure a specimen, another made inquiries in London, a third engaged three different persons who were sure of obtaining a supply, a fourth, on being apprized of my wishes, went out directly and shot one. Here it is, preserved in spirits, along with two Nuthatches.

From p. 70.

The birds of the family of Picinæ are remarkable for their habit of ascending the trunks and branches of trees, while clinging to which with their curved and sharp claws, they derive considerable aid from their very stiff and strong tail, the tips of the feathers of which are pressed against the bark. Another peculiarity is seen in the form of their straight, tapering, angular, wedge-tipped bill, with which they perforate or chip off the bark and wood, in search of insects and their larvæ. A third striking character which they possess, although it is not peculiar to them, is exhibited by their slender, stiff-pointed and bristled or prickly tongue, which they have the power of suddenly thrusting out, in order to draw with it into their mouth the small insects on which they feed. All the species of Woodpecker, about twenty in number, which I have examined, present this structure, with slight modifications.

The examination of organs is certainly the most pleasing and important part of zoology, and, whatever superficial observers

may say, must ~~soon~~ sometime be generally practised; ~~but as we have a good opportunity, we may take the measurements of the bird:—Length 13½ inches, extent of wings 20; wing from flexure 6½; tail 4 8/12; bill along the ridge 1 8/12, along the edge of lower mandible 1 11/12, width of mouth 6/12; tarsus 1 2/12; hind toe 4/12, its claw 4/12; second or inner toe 6/12, its claw 7/12; third 1 inch, its claw 8/12; fourth or reversed toe 9/12, its claw 7/12. There are six scutella on the tarsus, four on the first toe, nine on the second, twelve on the third, and eleven on the fourth.~~ Now for our dissection. We have obtained for dissection a perfect specimen of the Green Woodpecker, or Picus viridis. Here the bird is laid on its back, the integuments are removed from its breast, neck, and head; and the parts are before us: the mandibles, the tongue, the hyoid bones, the salivary glands, the trachea, and its muscles. See Plate XV.

Our principal object is to trace out the apparently complex apparatus by which the tongue is protruded and retracted. Two slight diagrams will afford a sufficiently correct idea of the mechanism employed, which is extremely simple. Let Fig. 1, *a b*, be an object or instrument, which is to be carried forward a certain distance, and then drawn back. All that is necessary is to lengthen it behind, *a c*, fix a cord to the end or to some part, *c d*, pull this cord, and by means of another cord, *a e*, restore it to its original position. As the elongated part or appendage cannot in a bird project straight backwards, for then it would pass through the vertebræ and spinal marrow, it must be split into two, one-half passing along each side of the neck; and as the length of this part must correspond to the distance to which the tip of the tongue is to be protruded, it becomes necessary to dispose of it so as not to impede the functions of the neighbouring parts, and thus it may conveniently be curved over the head, between the skull and the skin. Fig. 2 represents such an instrument, it being merely Fig. 1 modified: *a b*, the tongue; *a c*, its double appendage; *d c*, the muscles or cords by which it is pulled forward; *a e*, those by which it is brought back.

Now, the tongue of this Green Woodpecker, when examined superficially, in its retracted state, presents the appearance of a slender, cylindrical, somewhat tapering, fleshy body, terminated by a slender, flattened horny point, of which the upper

Picinæ.

surface and sides are covered with very delicate acicular, stiff-fish, reversed bristles or prickles. These prickles assist in attaching the insect or larva to be seized, but the object is not transfixed, as some have imagined, otherwise, being so delicate, the bristles would be broken, or at all events would render it impossible to disengage the insect for the purpose of swallowing it. The fleshy part of the tongue is $1\frac{1}{4}$ inch in length, its horny tip $\frac{1}{4}$; but it may be drawn out so that the tip shall be protruded nearly 2 inches beyond the tip of the bill; it being in this state $3\frac{8}{12}$ inches long. The protrusion is seen to be effected, not by any elasticity or extensility of the tongue, but in consequence of its basal part sliding forwards from within a sheath, which is lined with a smooth membrane, continuous with that which covers the tongue, of which the basal part when retracted is withdrawn by a kind of intussusception, or as if by turning the finger of a glove partly within itself. Besides its general covering, and some delicate muscles, the tongue has internally a very slender bone, not thicker than a strong hog's bristle, $1\frac{8}{12}$ inch in length, tipped by a broader, somewhat sagittiform bone, $\frac{2\frac{1}{2}}{12}$ long, which is the basis of the horny part. The long bone is the basi-hyal, and the small terminal one the glosso-hyal. Appended to the base of the former are two filiform bones, $1\frac{1}{4}$ inch long, to which are appended two still more slender bones, $5\frac{1}{4}$ inches in length. These bones, the apohyal and ceratohyal, are flattened and tapering, and diverging as they proceed backward, curve on the sides of the neck, ascend, converge on passing the neck, meet on the top of the head, leave the median line when opposite the eyes, digressing to the right side, and terminate near the base of the upper mandible, being attached by two slender ligaments to the outer side of the depression in which the right nostril is situated. The length from the tip of the bill to that of the hyoid bones is $8\frac{5}{12}$ inches. We have thus the solid parts represented by the diagrams Figs. 1 and 2.

A tongue of this kind may be protruded in two ways. Either the elongated apohyal and ceratohyal bones may be made to slide in a sheath, so that their tips shall pass from the forehead to the occiput, or even as far as the base of the lower jaw, in which

case the tip of the tongue would advance to a corresponding distance. Or, the tips of the ceratohyal bones being fixed, or having only a little motion by means of an elastic ligament, these bones may form a very large curve, passing down the sides of the neck to a great distance from the base of the skull, in which case the straightening of this curve would carry forward the tip of the tongue. In very many Woodpeckers, the whole ceratohyals with their muscles slide backwards and forwards in a sheath; but in this species the tips of these bones being nearly fixed, the protrusion of the tongue is effected by the contraction of the muscle straightening the lower part, or that nearest the mouth, which moves in a sheath.

A slender muscle proceeds from the lower jaw pretty far forward, on each side, passes backwards, soon attaches itself to the corresponding ceratohyal bone, runs along its whole length, covering or enclosing it, and is attached to its tip. This muscle, by contracting, suddenly thrusts out the tongue. To the basihyal bone in the cylindrical part of the tongue, is attached on each side a muscle, which proceeds downward in front of the bones of the larynx, on passing which it turns aside, winds round the trachea behind, reappears on the other side, and is twice wound round the trachea, to which it finally adheres. This muscle and its fellow, the trachea being fixed by other muscles, draw back the tongue when it has been protruded. In all Woodpeckers these muscles necessarily exist, and are attached to the trachea, but are specially twisted round it only in the Green Woodpecker among the European, and the Golden-winged Woodpecker, among the North American species.

To complete the apparatus, two very large, elongated glands, analogous to the parotid and sublingual in man, secrete a viscid saliva, conveying it each by a single tube, which opens into the mouth, at the angle or point of meeting of the crura of the lower jaw. The fluid thus copiously secreted, fills the place where the tip of the tongue lies when retracted, so that the prehensile bristly tip of that organ is always bedewed with it. Thus a perfectly efficient instrument for seizing the small and often agile objects on which the Woodpecker feeds, is provided by a very simple contrivance.

Three different views of our Woodpecker's head and neck will render the structure very obvious. In the lateral view of the parts, Fig. 3, are seen *a b*, the two horny mandibles; the tongue, *c d e*, its terminal barbed portion, *c d*, the fleshy part, *d e*; the elongated parts of the hyoid bones, with their muscles, *f g*; the eye and orbit, *h*; the salivary glands, *i i*; the neck, *j*; the œsophagus, *k k*; the trachea, *l l*; the lateral or contractor muscles of the trachea, *m m*; its cleido-tracheal muscles, *n n*, attached to the furcular bone or clavicle, *o*.

Viewed from before or beneath, the parts seen are: the lower mandible, *b*; the salivary glands, *i i*, turned a little aside; the hyoid bones with their muscles, *f g*, *f g*; the œsophagus, *k k*; the trachea, *l l*; its lateral muscles, *m m*; the cleido-tracheal muscles, *n n*; the glosso-laryngeal muscles, *p p*, which, being twisted round the trachea at one end, and attached to the base of the tongue at the other, draw that organ backwards into the mouth; and lastly, the muscles, *q q*, which, arising from the sides of the lower jaw, attach themselves to the apohyal bones, *f g*, are continued to their extremity, and on contracting thrust out the tongue.

Fig. 5 represents the apohyal bones and their muscles, *a a*, curving over the occiput, meeting on the top of the head, running forward in a groove, deviating beyond the eyes to the right side, and attached to the upper jaw near the right nostril, *b*.

Several modifications of these parts will be seen in the fifth volume of Mr Audubon's Ornithological Biography, of which the anatomical descriptions and drawings were made by me.

The trachea is $3\frac{6}{12}$ inches in length, from three to two twelfths in breadth, and composed of about 80 rings, of which the upper are circular, the rest flattened; the last entire ring bipartite, and succeeded by two dimidiate rings. The lateral or contractor muscles are strong, as are the sterno-tracheal; and there are two very slender inferior laryngeal muscles.

The digestive organs may now be examined. See Pl. XIV, Fig. 5. The œsophagus, *a b c*, is $5\frac{1}{4}$ inches long, its width from half an inch at the commencement to three-twelfths, but in the proventricular portion, *b c*, dilated so as to form an

Picinæ.

oblong sac, an inch and three quarters in length, and ten and a half twelfths in its greatest breadth. The stomach, *c d*, is small, of a roundish form, considerably compressed, nine and a half twelfths in length, ten-twelfths in breadth; its lateral muscles of considerable strength, one being four and a half twelfths thick, the other three twelfths; the lower muscle prominent, but very thin; the tendons large; the cuticular lining dense, longitudinally rugous, and yellowish-red. The proventricular glands, which are very small, form a belt an inch and a quarter in breadth. The intestine, *d e f g*, is rather short, but extremely wide, and destitute of cœca; its entire length sixteen inches; the duodenal portion two inches and three quarters in length, and seven-twelfths in width; the rest of the intestine contracting to five-twelfths; the cloaca, *i j*, a very large elliptical sac, ten-twelfths and a half in width. There is no gall-bladder. The contents of the proventriculus are 638 insects and pupæ, most of them ants, four muscæ, and a few coleoptera. In the stomach is a mass of the same comminuted, probably 200 more. Consider how many insects a Green Woodpecker would at this rate devour in the course of a year. Making the above number the daily average, we find the annual amount to be 305,870, and that of twenty years 6,117,400. Very possibly the number may be double. How many muscular motions of climbing, creeping, pecking, tongueing, and swallowing, one cannot even imagine. What say the skin-and-feather ornithologists to all this? "A knowledge of anatomy is not necessary to the naturalist." No truly, not to such naturalists, to whom not even a knowledge of habits is of much importance. How is it that the proventriculus and stomach of a Woodpecker should bear so considerable a resemblance to those of a Petrel?

Hop. — to p. 61. As the Woodpeckers.

The gentleman who has sent me the specimen which we have now examined, Mr Harley, of Leicester, has also favoured me with observations relative to the birds of his neighbourhood, and prefaces them with a brief account of the district, to which it will be useful to refer on occasion.

"The small river Soar winds its course hard by the town, turning numerous mills in its progress. After irrigrating many a mead, and refreshing many a field, it falls into the Trent

about twenty-two miles north of Leicester. The town is situated on a bed of fine red clay, which is covered with a thick bed of gravel. In many parts the soil is deep, but in others scanty. The north-western side of the town is in general very low, with much water, caused by the river being turned for navigation, and its water made available for manufacture and other purposes. On each side of the Soar are low meadows, in many places wet and marshy, but generally very productive of fine grasses, which are I believe rather celebrated for fodder. The part of the county which I mean to describe lies between the town of Leicester and the south-eastern verge of Charnwood Forest, about six miles distant. After leaving the town, and proceeding about two miles due west, we come to a sort of blue clay, and find detached and scattered pieces of limestone, often containing belemnites. The vegetation here is very scanty, the trees are stunted, and ranpikes are very common. The land intervening between this clayey tract and Bradgate Park, or the Forest of Charnwood, is decidedly woodland, broken, and often picturesque, particularly about the pretty villages of Austy, Grooby, and Newtown Linford. Both the red and blue clays are conspicuous here, but we find them abruptly lost in the granite of Grooby or the schist of Bradgate Park or Charnwood. Two most beautiful streams pass through the villages of Newtown Linford and Grooby. The former rises near to Ulverscroft Priory, winds its way through some picturesque scenery, down a lovely valley, shaded by alders, and passing on to Newtown Linford, runs through Bradgate Park, to join the Soar near Quorndon. The other meanders through a rich and beautiful part of the country, and falls into the stream just mentioned six miles from Leicester. The woods here are rather extensive, particularly Martinshaw, Ulverscroft, and Sheet Hedges. They chiefly consist of oak, ash, and aspen, intermixed with birch, and mountain-ash, the underwood being almost invariably composed of hazel, white willow, holly, and honeysuckle. In the vernal months, these woods are bestudded with the beautiful Blue Hyacinth, Primrose, Wood Anemone, Sweet-scented Violet; and as the season advances, the Stitchwort, with its white starry flowers, and the little Germander Speedwell are

conspicuous in every walk. These woods also abound in some places with the Bear's Garlic, the Red Campion, Ragged Robin, and Herb Robert.

" I ought not to omit mentioning Grooby Pool, which is described by Leland, a distinguished antiquary of the sixteenth century, as a ' faire and large pole.' He says, ' there is a faire and large parke by the place, a vi miles in circumpasse, there is also a poor village by the place, (Grooby, this place gives title to the Greys, the present Earl of Stamford is Lord Grey of Grooby)—and a little broke by it, and a quarter of a mile from the place in the bottom, there is a faire and large pole as lightly is in Leycestreshire, there issueth a broket out of this lake that after committs by Grooby and there dryvith a mylle and after resortith to the Sore River.' Grooby Pool in its present state contains about forty acres, and is somewhat less than a mile in circumference. It was formerly much larger, containing between seventy and eighty acres, and extending, it is supposed, to the Ashby-de-la-Zouch road; but successive encroachments of reeds and other aquatic plants have reduced it to its present size. It is of an oval form, with a few slightly indented bays and projecting points of syenitic rock on its margin. Its utmost length, drawn in a line, from the flood-gates, through the island, to the opposite shore, is about 380 yards. It is in few places more than ten or twelve feet deep, and the greater portion is much more shallow. In the dry summer of 1826, it was drained very low, for the purpose of cleaning it out to the extent of two or three acres, where the water-plants had nearly choked it up.

" Bradgate Park forms the south-eastern boundary of Charnwood Forest, and was in early times commonly called the ' Waste.' Leland says it is ' a forest of xx miles or more in cumpasse, having plenty of woode, the most part belonging to the Marquisse of Dorset, the reste to the King, and the Earl of Huntingdon.' The park in its present state is about seven miles in circumference, and formed into several divisions by means of stone-walls, the materials of which are found upon the spot. It is mostly covered with fern, Pteris aquilina, and the projecting bare and abrupt rocks, rising out here and there,

with a few scattered gnarled oaks, shivered and blasted, in their last stage of decay, present a scene of wildness and desolation highly contrasted with some of the adjoining beautiful valleys and fertile country. The rocks are in a great measure schistose, being of primitive slate or greywacke, and referred by modern geologists to the Cambrian system.

"The Forest of Charnwood, which this park abuts upon, has had an extent of fifteen or sixteen thousand acres. The Inclosure Act passed in 1811, when it soon became disafforested, and was shorn of its ancient glory. Now, it is only in the more elevated parts, to which the plough is denied access, that any traces of its pristine condition remain. I may however mention a tract of land situate amongst the Whitwick Rocks, which overhang Grace Dieu Priory, as having escaped cultivation. Here the gorse blooms in its golden beauty, the Foxglove, loveliest of our forest flowers, gladdens every dell, and enamels every rock, and the Blue Bell, Campanula rotundifolia, nods to the passing breeze. Here too we find occasionally a patch of brown heath, sometimes tenanted by the Dottrel, the Grey Plover, and the Ringed Thrush. I suppose this tract of table-land may extend to a thousand or fifteen hundred acres. The Trappist monks have a monastery here, and are cultivating a part of the ground.

"I shall not attempt further description of our forest range, lest I should become tedious. Yet I ought to say, for your guidance, that Charnwood Forest is free from timber, and was so at the time of its inclosure in 1811. But the recently planted clumps of trees and coppices are growing very rapidly, so that in another generation there will remain very little of its present bareness, except the rugged rocks, and everlasting hills. Around Charnwood Forest, unless in the park and wood, and very old inclosure, the Elm, Ulmus campestris, is the principal tree; and even for miles south of Leicester it prevails."

From p. 55.

Order V. Scansoria. Scansorial Birds.

~~VII.~~ ~~SCANSORES.~~ ~~CLIMBERS.~~

In the arrangements of Cuvier and many other naturalists, a vast number of birds differing from each other in form, structure, and habits, but agreeing in having their outer or fourth toe directed backwards, are brought together to constitute an order, destitute of any other common character than that just mentioned, and to which the names of Scansores or Climbers, and Zygodactyli or Yoke-footed Birds, have been applied. On the same principle, all birds having only the first toe directed backwards ought to constitute a single order, in which Eagles, Pheasants, Pigeons, Finches, and Creepers should be arranged side by side. In truth, a Parrot, a Toucan, a Cuckoo, a Trogon, and a Jacamar, are as essentially different from each other as a Falcon, a Raven, a Nightingale, a Goat-sucker, and a Humming-bird; and as the groups of the so-called order Scansores present strongly marked differences in their digestive organs, as well as in their habits, I must, in consistency with the principles which I have adopted, reject the opinions of those, however esteemed, who choose on occasion to shut their eyes on the truth.

"The third order of birds, or the Climbers," says Cuvier, "is composed of birds of which the outer toe is directed backwards like the hind toe, whence there results a firmer support, of which some genera avail themselves for clinging to the trunks of trees, and climbing upon them. The common name of Climbers, Scansores, has therefore been given to them, although

in strictness it does not apply to all, and although several birds truly climb without belonging to this order by the disposition of their toes." Mr Swainson however adds these birds to the Scansores, from which on the other hand he ejects many which, although zygodactylous, do not climb or even walk, ~~although he~~ retains a very great number of species which no person has ever seen climbing. His Climbers are not an order, but a tribe of the Perchers, and are composed of Toucans, Parrots, Woodpeckers, Creepers, and Cuckoos, "the junction of the last with the first being effected by the great hollow-billed genus Phœnicophæus, and by Scythrops, the Australian genus of Toucans;" but he wisely refrains from attempting to give any general character of the group. M. Temminck defines his Zygodactyli thus: "Bill of varied form, more or less arched, or much hooked, often straight and angular. Feet always with two toes before and two behind, the outer hind toe often reversible." M. Lesson observes: "Every bird of which the toes are disposed two before and two behind, is of the order of Climbers. The manners of most of the species which belong to it are not known; besides they vary in almost every genus. This is also the case with their food, their habits, and the climates in which they live. Nothing general can be said with respect to them." It is quite unnecessary to offer any remarks on statements like these, for the folly of forming such heterogeneous associations must be apparent to all.

The Parrots differ from the other birds of this artificial group in many essential respects. Their tongue is short, thick, fleshy, and rounded, or emarginate; their œsophagus is enlarged to form a crop similar to that of the gallinaceous birds; their proventriculus is very large; their stomach very small, but muscular; their intestines of moderate length and width. Their mode of climbing is by grasping the branches, and they aid their ascent with their bill. From these and other circumstances I should conceive that they form a very distinct order.

The digestive organs of the Woodpeckers differ from those of the Parrots, as will presently be seen, and those of the Cuckoos differ as much from both. With the internal structure of the other groups I am not sufficiently acquainted to be

able to form any reasonable idea of the manner in which they ought to be arranged. But this is of little consequence in the present case, as in Britain there are only representatives of two of the groups, the Woodpeckers and the Cuckoos, the former of which, with the Toucans and Barbets, I would consider as forming the order Scansores.

The order Scansores, or Climbers, as here instituted, is characterized by a large, strong, nearly straight bill, a long or extensile tongue, and *narrow* zygodactyle feet. Certain other birds also climb much in the same manner, as the Certhiæ, Tichodromæ, and Dendrocolaptæ, already spoken of, but their feet differ in having only one toe directed backwards; and as we name Raptores birds which are peculiarly rapacious, although species of other groups are equally so, and apply to a certain series the name of Cantatores or Songsters, although birds of other groups sing, so, with equal reason, we may designate as Climbers the species of the present group.

The feet of the Climbers are short and of moderate strength; their tarsi more or less compressed, anteriorly scutellate, posteriorly with two series of scales; the toes compressed, of moderate size, excepting the first, which is short, and sometimes rudimentary or even wanting, the second and third united at the base, the fourth directed backwards, and longer than the second; the claws strong, much arched, high, compressed, laterally grooved, and very acute. The bill is straight, or slightly curved, usually about the length of the head, sometimes much longer, strong, tapering, and compressed toward the end. The tongue is long, slender, flattened and fringed, or cylindrical, fleshy, with a horny tip, of which the sides are furnished with reversed denticulations, spicula, or bristles. In the latter case, the horns of the hyoid bone being elongated so as to curve over the head, as far as the base of the upper mandible, or even to stretch round the right orbit, the tongue is extensile in a degree corresponding to the space traversed by the tips of these bones, which can be drawn backwards over the occiput, and again forwards to beneath the ears. See Plate XV. The œsophagus is rather narrow, and without dilatation; the proventriculus extremely large, the stomach roundish, its muscular coat moderately thick,

ix. Scansorial Birds.

and its epithelium hard and longitudinally rugous; the intestine of moderate length, and rather wide, without any traces of cœca, and the cloaca enormously large. See Plate XIV, Figs. 4, 5, 6.

They cling to the bark of trees by means of their strong curved and acute claws, ascend vertically or obliquely, fix themselves against the surface by their claws, tap the loose bark of decayed trees with their bill, or detach it in fragments, or break up the rotten wood, to obtain the larvæ and insects which shelter there. They nestle in holes bored by themselves in decayed trees, are generally of solitary habits, and reside at all seasons in woods and forests. Their food is not entirely composed of insects and larvæ, for berries and other soft fruits, as well as seeds, are greedily devoured by them.

ix. The Scansores thus characterized, are composed of three families; the Picinæ or Woodpeckers, Rhamphastinæ or Toucans, and Bucconinæ or Barbets. They are connected with the Cuculinæ by the Wrynecks, which have the digestive organs and tongue similar to those of the Woodpeckers, but in most other respects agree with the Cuckoos. The Jacamars seem to connect them with the Kingfishers, ~~while~~ the Trogoninæ and Bucconinæ are in some measure intermediate between them and the Parrots.

with the Goat-suckers

The great differences in the organization, habits, food, and distribution of the birds forming the order Scansores of authors, seem clearly to indicate that the zygodactylous foot is not a feature of primary importance, and that consequently the characters of the orders or larger groups must be derived from some more essential ~~circumstance~~ ~~feature~~ fact of organization.

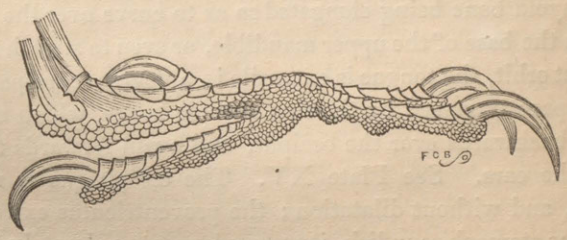


Fig. 198.

Family I. PICINÆ. Picine Birds.

WOODPECKERS AND ALLIED SPECIES.

Like the Psittacinæ, the Picinæ form a well-defined group, of which the affinities are not obvious. Their more essential characters are to be found in their straight, tapering, angular bill, which is wedge-shaped at the end, and constructed for the purpose of splitting or perforating bark and decayed wood; and their graduated decurved tail, of which the feathers have very strong, elastic shafts, with attenuated webs; together with their short, strong, zygodactylous feet, and stout, compressed, curved acute claws. The peculiarities of their tongue and digestive organs ~~have already been~~ described.# The skeleton presents several remarkable peculiarities as compared with that of a Jay or other bird of that family. ~~~

on the back. This, however, is not peculiar to Woodpeckers. The lateral processes of the caudal vertebræ are very large, so as to prevent much lateral motion. In the accompanying figure, which represents the sternum of Picus pileatus, the

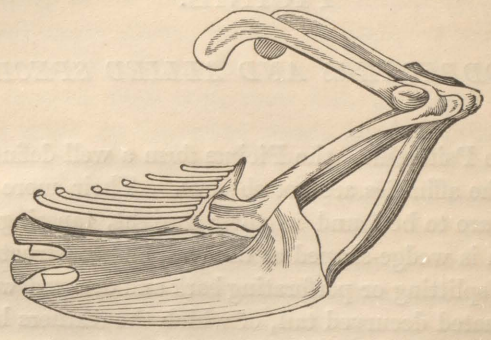


Fig. 199.

body is seen to have two notches on each side behind, a rather low crest or ridge, which however is much prolonged anteriorly, a slender furcula, of which the crura are extremely compressed, and not widely separated, long coracoid bones, and scapulæ singularly curved downwards and enlarged at the end, in which respect they differ from those of any birds known to me. The humerus is large, and has a small bone in its articulation. The metacarpus consists of two undivided bones; there are, besides the pollex, two digits, one of two phalanges, the other of one. The pelvis is of moderate size. The femur also moderate. There is a small patella. The tibia is rather stout, and the fibula extends to half its length; the tarsal bone is slender; the phalanges are two, three, four, and five, as usual; the last phalanx of each toe large, compressed, with a deep lateral groove.

As the Woodpeckers seem to be analogous to the Parrots, it appears reasonable that they should form several genera, and, accordingly, some authors, perhaps for the purpose of making or finding the necessary number of groups for their circles, have constructed numerous subgenera, of which the characters are derived from very slight differences in the form of the bill, and the length

of the tarsus and fourth toe. After a careful examination of numerous species, I feel convinced that the Picinæ are formed of several genera, which, however, exhibit so little variation in structure, that in presenting the history of the few which occur in Britain, it is quite unnecessary to perplex the reader with insignificant distinctions. The groups into which the Woodpeckers might be disposed, cannot be recognised by marks in any degree approaching in prominence to those of the genera of the Falconinæ, Psittacinæ, Columbinæ, Gallinæ, and other natural and equivalent families. The only one of the proposed genera that would seem to a beginner to have some right to stand apart, is Colaptes, of which however the characters are derived from very slight variations in the bill, which has the culmen a little more arched than is usual, and the wings with stronger or at least more conspicuous shafts.

The genus Yunx, which differs in having the bill shorter and more depressed, and the tail soft, may be appended to the Picinæ, as the tongue and digestive organs are nearly similar; and Yunx minutissimus of authors is certainly more of a Woodpecker than a Wryneck, although its tail is not stiff.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. PICUS. WOODPECKER.

Bill ~~about the length of~~ rather longer than the head, straight, strong, compact, with its horny covering very thick, ~~straight~~, pentagonal at the base, four-sided towards the end, tapering to an abrupt, laterally bevelled, point. ~~Tail-feathers stiff, decurved, attenuated at the end.~~

1. *Picus Martius. Great Black Woodpecker.* Brownish-black with red on the head.

1. Dendrocopus major. Greater spotted

~~2. *Picus Pipra. Pied* Woodpecker.~~ Male with the upper part of the head, the back, and a band on the neck, bluish-black, the occiput crimson; the abdomen and lower tail-coverts red. Female similar, but with the occiput black.

2. Dendrocopus minor. Lesser Spotted

~~3. *Picus striolatus. Striated* Woodpecker.~~ Male with the crown

Genus II. Dendrocopus. Spotted Woodpecker.

Bill shorter than the head, straight, conical, strong, compact, pentagonal at the base, four-sided toward the end, tapering to an abrupt, laterally bevelled point.

bright red, the hind-neck and forepart of the back black, the hind part barred with white, sides of the head and neck white, with a black band; lower parts brownish-white, longitudinally streaked with dusky. Female similar, but with the crown brownish-white.

4. *Picus viridis. Green Woodpecker.* Upper parts yellowish-green, with crimson on the head.

IV.

GENUS ~~II.~~ YUNX. WRYNECK.

Bill shortish, slender, straight, tapering, acute. Tail-feathers soft and rounded at the end.

1. *Yunx Torquilla. Wryneck.* Upper parts brownish-grey, spotted, undulated, and dotted with blackish-brown. Common

Genus III. Gecinus. Green-Woodpecker.

Bill rather long, straight, angular, tapering, with the dorsal outline somewhat convex, the elevated line from over the nostrils to the tip distinct and close to the ridge, the tip truncate and laterally bevelled.

1. Gecinus viridis. Common Green-Woodpecker.

Upper parts yellowish-green, with crimson on the head.

Linn.

Genus I. PICUS. WOODPECKER.

Bill rather long, stout, conical, pentagonal, straight, laterally bevelled at the tip so as to present an edged, abrupt, wedge-like termination: upper mandible with the dorsal outline declinate and straight, the ridge sharp, the sides flat and sloping, with a longitudinal ridge, the edges a little inflected, the tip narrow and truncate; lower mandible with the angle short and rather narrow, the dorsal line ascending and straight, the sides flattened and nearly erect at the base, but beyond the angle sloping, and more or less convex, the edges slightly inflected, the tip slightly truncate; the gape-line straight.

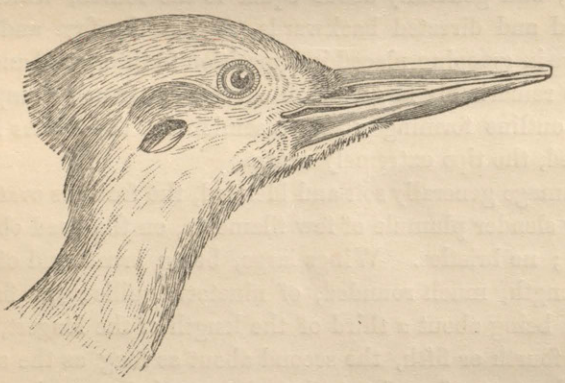


Fig. 200.

The upper mandible within is slightly concave, with three longitudinal prominent lines, the lower more deeply concave, with a median prominent line. The tongue is extensile, long, slender, subcylindrical, fleshy, with a horny, tapering point, of which the margin, and usually part of the upper surface are covered with acicular reversed prickles. The œsophagus is of moderate width, without crop, but dilated at the lower

part into a large sac, on which the proventicular glands are dispersed. Stomach of moderate size, roundish, a little compressed; its muscular coat thick and composed of large fasciculi, the epithelium thin, dense, longitudinally rugous. Intestine of moderate length and very wide; no cœca; cloaca very large, globular or elliptical. Plate XIV, Figs. 4, 5, 6.

Nostrils elliptical or oblong, in the forepart of the short nasal groove, and concealed by reversed bristly feathers. Eyes of moderate size. Aperture of ear also of moderate size, roundish, the inner opening like a transverse slit.

The general form is rather slender, the body somewhat elongated, the neck of ordinary length, the head oblong, and of moderate size. The feet very short; the tarsus very short, not robust, with eight anterior scutella, and numerous small scales on the sides and behind; the first toe very short and directed outwards and backwards; the second of moderate length, and united as far as the second joint to the third, which is much longer, and generally about equal to the fourth, which is separated and directed backwards, so that the first and fourth toes are in grasping placed in opposition to the second and third. Claws remarkably large, much curved, extremely compressed, their outline forming nearly a semicircle, their sides broadly grooved, the tips extremely acute.

Plumage generally soft and blended, the feathers ovate, with a very slender plumule of few filaments, on the head oblong or linear; no bristles. Wings large, being broad and of moderate length, much rounded, of nineteen quills; the first very small, being about a third of the length of the longest, which is the fourth or fifth, the second about as long as the seventh. Tail short or of moderate length, rounded or wedge-shaped, of twelve feathers, of which the lateral are very short, and lie over the next, the rest but especially the central, decurved, with very strong elastic shafts, and tapering extremities, of which the barbs or filaments are deflected, strong, elastic, and by being pressed against the bark afford the bird a strong support. Fig. 201.

After Petrel. p. 61.

The Woodpeckers search the trunks and branches of trees, especially those which are decayed, for insects and larvæ, to

procure which they drive off chips of the bark, or dig into the wood. The structure of all birds is of course admirably adapted to their mode of life, and of none more so than of any other; but sometimes we are able to trace the connection between a curious mechanism and its results, as in this case, where the form and firmness of the bill are obviously so well fitted for the purpose of digging, while the strong, curved, extremely fine-pointed claws, enable the bird to cling with ease to the bark, and its stiff tail, by being pressed against its surface, steadily supports it while thus engaged. If a person apply the lower surface of the tail of a woodpecker to his hand, he will find that it requires a vast force to make it slip backwards, such a force as can never be overcome by the weight of the bird. Lastly, the curious but simple apparatus by which the tongue is extended, so that it can be thrust into a hole or fissure far beyond the point of the bill, while its tip is barbed with small filaments, which like the teeth of a rake, serve to pull up the larva or insect, is not less beautiful than easily intelligible.

These birds are generally distributed, but more abundant in the warmer regions, although some live on the borders of the frigid zone. Their residence is in the forests and woods. Besides insects and larvæ, they eat seeds of various kinds, berries, grapes, and other soft fruits, but their stomach is not formed for grinding, and seeds which they may have swallowed entire are passed undigested. Their flight is powerful. When they proceed to a distance they fly in an undulating manner; but otherwise directly, or in a single curve, descending from the higher branches of a tree to the lower part of a trunk, which they ascend as if by starts, sometimes in a spiral manner, tapping with their bill, as they proceed, in order to discover the parts that are unsound, on finding which they dig assiduously into them, driving off the bark and chips of rotten wood with great energy, until they have succeeded in obtaining the insects and larvæ which have sheltered in them. They nestle in a hole dug by themselves in a decayed tree, and deposit the eggs in its bottom, without generally interposing anything between them and the wood. The eggs are not numerous, and are generally

white. Woodpeckers are for the most part unsocial birds, as regards their own species; but frequently they may be seen in company with Nuthatches, Creepers, Tits, and some other birds of similar habits.

To p. 70. As the Woodpeckers &c.

Four species occur in Britain, but of these one has been seen only in a very few instances, and the species which is most common in some districts is not generally distributed.



Fig. 201.

Linn.

1. PICUS MARTIUS. THE GREAT BLACK WOODPECKER.

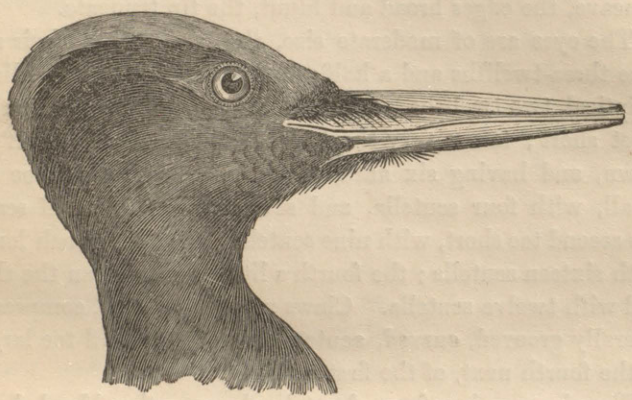


FIG. 202.

Picus martius. Linn. Syst. Nat. I. 173.
Picus martius. Lath. Ind. Orn. I. 224.
Great Black Woodpecker. Mont. Orn. Dict.
Pic noir. Picus martius. Temm. Man. d'Orn. I. 390.
Great Black Woodpecker. Picus martius. Selb. Illustr. I. 375.
Picus martius. Great Black Woodpecker. Jen. Brit. Vert. An. 151.

Plumage brownish-black; the male with the upper part of the head, the female with only the occiput, crimson.

MALE.—The Great Black Woodpecker is one of the largest species of the genus, being about equal in size to the Ivory-billed, Picus principalis, of America. Its body is moderately full, the neck slender, the head rather large, oblong, and compressed. The bill is somewhat longer than the head, straight, strong, broader than high at the base, tapering, heptagonal, compressed toward the tip, which is cuneate and vertically abrupt. The upper mandible has the dorsal line almost perfectly

straight, the ridge sharp, the slope concave to the lateral ridges, which are parallel to the dorsal ridge, and nearer it than the edges, until towards the end, the sides externally of these ridges sloping and convex, the edges overlapping and strong, at the end worn flat, the tip truncate; the lower mandible with the angle rather long and narrow, the ridge linear, the sides at first gently sloping, then convex, at the base erect and somewhat concave, the edges broad and blunt, the tip truncate.

The eyes are of moderate size, the diameter of their aperture three-twelfths and a half; the nostrils very small, linear-elliptical, two-twelfths long, basal, concealed by bristly feathers. Feet short; tarsus very short, feathered more than half way down, and having six anterior scutella. The first toe very small, with four scutella, and several series of small scales; the second toe short, with nine scutella; the third much longer, with sixteen scutella; the fourth a little shorter than the third, and with twelve scutella. Claws very large, high, compressed, laterally grooved, curved, acute; that of the third toe largest, of the fourth next, of the first smallest.

The plumage is soft, moderately glossy, rather blended; the feathers oblong and rounded. The short nasal membrane is covered with stiff reversed bristle-feathers. The wings are very long and rounded; the quills nineteen; the primaries straight, tapering, stiff; the first less than a third of the length of the fifth, and pointed; the second an inch and a half shorter than the third, which is five-twelfths of an inch shorter than the fourth; the fifth one-twelfth longer than the latter, and the sixth about as much longer than the fifth; the secondaries are broad, rounded, and very long. The tail is rather long, of ten stiff decurved feathers, having the groove of their shaft very deep and wide, and their tip emarginate, the terminal filaments extending beyond the end of the shaft. Besides these, there is on each side an incumbent small, soft, rounded feather.

The bill is bluish-white, with the tip bluish-black. The eyes are said to be yellowish-white. The feet and claws black. The general colour of the plumage is brownish-black, on the sides of the head glossed with blue; the whole upper part of the head bright crimson.

Length to end of tail 19 inches; bill along the ridge $2\frac{4}{12}$, along the edge of lower mandible $2\frac{3}{4}$; wing from flexure $9\frac{1}{2}$; tail $7\frac{1}{4}$; tarsus $1\frac{5}{12}$; first toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{5}{12}$; second toe $\frac{7\frac{1}{2}}{12}$, its claw $\frac{11}{12}$; third toe $\frac{10}{12}$, its claw $\frac{11\frac{1}{2}}{12}$; fourth toe $\frac{10}{12}$, its claw $\frac{10}{12}$.

Female.—The female is scarcely smaller, with the plumage more tinged with brown, and only a small crimson patch on the occiput.

Length to end of tail $18\frac{1}{4}$ inches; bill along the ridge $2\frac{4}{12}$, along the edge of lower mandible $2\frac{8}{12}$; wing from flexure $9\frac{1}{2}$; tail $7\frac{5}{12}$.

Habits.—This species has been met with so seldom in Britain, that nothing has been recorded of its manners as observed there. M. Temminck states that it "inhabits the north of Europe, extending to Siberia; is less abundant in the great mountain forests of Germany and France; feeds on perforating larvæ, bees, wasps, ants, and caterpillars; and when these fail, on nuts, seeds, and berries; nestles in the holes which it bores, as well as in the natural hollows of trees; and lays three eggs, of a shining white." It is said to frequent the pine forests of the Swiss and Tyrolese Alps, and to extend as far as Asia Minor.

Dr Latham informs us that it has been sometimes met with in Devonshire; Dr Pulteney, that two or three specimens have been shot in Dorsetshire; Lord Stanley is said to have shot one in Lancashire; and another is reported to have been killed in Battersea Fields, in 1805. Mr Yarrell states that he has been told of two instances of its having been killed in Yorkshire, and mentions its occurrence in Lincolnshire, Norfolk, and Hampshire. Although Sir Robert Sibbald includes it among the birds of Scotland, it has not been obtained in that country for many years. The above descriptions are taken from two specimens in my collection, a male and a female, which I purchased from Dr Madden, to whom they had been sent by their owner, as having been shot near Nottingham. That gentleman afterwards obtained for me a certification of the fact by the person who had procured them.

Genus II. Dendrocopus. Spotted Woodpecker.

1. Dendrocopus major. Linn. Greater Spotted Woodpecker.

~~PICUS PIPRA. THE PIED WOODPECKER.~~

~~GREATER SPOTTED WOODPECKER.~~ WHITWALL. WOOD-PIE. FRENCH-PIE. SNAGAN-DARAICH.

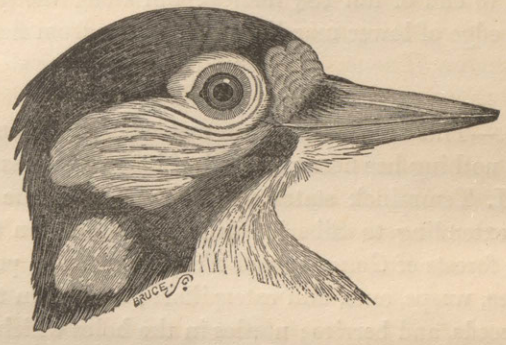


Fig. 203.

Picus major. Linn. Syst. Nat. I.
Picus major. Lath. Ind. Orn. II.
Greater Spotted Woodpecker. Mont. Orn. Dict.
Pic épeiche. Picus major. Temm. Man. d'Orn. I. 395.
Greater Spotted Woodpecker. Picus major. Selb. Illustr. I. 376.
Picus major. Greater Spotted Woodpecker. Jen. Brit. Vert. An. 150.

Male with the upper part of the head, the back, and a band on the side of the neck, bluish-black; a patch of crimson on the hind-head; a broad band of white over the forehead and under the eye, a patch on the side of the neck, a narrow line over the eye, and the scapulars, white; the lower parts brownish-white, excepting the abdomen and lower tail-coverts, which are crimson. Female similar, but with the occiput black, the white parts tinged with yellow, and the lower pale-brown. Young with the black parts tinged with brown, and the top of the head crimson.

Male.—This species, which is about the size of the Missel Thrush, is rare in all parts of Britain, although very exten-

sively distributed. The individuals from which my descriptions are taken were killed in the northern part of the middle division of Scotland; and I have examined skins of many others shot in various parts of England, as well as in France.

The form is rather slender, the body elongated, the neck of moderate length, the head oblong. The bill is straight, strong, conical, angular, and considerably shorter than the head. The upper mandible has the dorsal line almost perfectly straight, the ridge sharp, the sides flat and sloping, an oblique angle or prominent line from the nasal groove to the edge near the end, the tip truncate. The lower mandible also has the ridge sharp, and almost straight, the sides nearly flat, but towards the inflected edges rounded, the tip truncate in a slight degree. The mouth is of moderate width. The tongue vermiform, terminated by a narrow, flat horny point, which is ciliated backwards with short bristles. The œsophagus is four inches long, rather narrow, the proventricular part however very wide; the stomach roundish, a little compressed, its muscular coat thin, and its cuticular lining smooth, somewhat villous, and without rugæ; the intestine fifteen inches long, its duodenal portion four-twelfths in diameter; no cœca. Plate XV, Fig. 4.

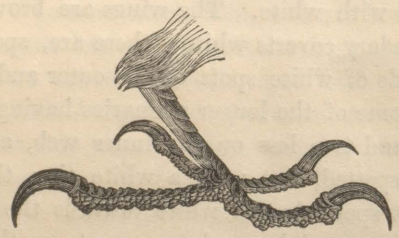


Fig. 204.

The tarsus is very short, moderately stout, with seven anterior scutella, and numerous small scales behind. The first toe is very short, with five scales; the other toes gradually longer and larger, the fourth directed backwards and outwards, the second with nine, the third with eleven, the fourth with fifteen scutella. The claws are much arched, deep, extremely compressed, broadly grooved on the sides, and somewhat abruptly pointed.

The plumage is soft, blended, and somewhat silky. The

Dendrocopus major.

wings are large, broad, and rounded; the quills nineteen; the first very small, the fourth longest, the fifth next, the third longer than the sixth, the second nearly as long as the seventh; the secondaries broad, rounded, and incurvate. The tail is of ordinary length, much rounded or cuneate, of ten feathers, having very strong shafts, which are decurvate at the end, excepting the lateral, and worn to a double point, the barbs extending beyond the end of the shaft; besides which there is on each side a very small incumbent soft rounded feather.

The bill is dark purplish-grey, darker at the end, the lower mandible paler. The feet and claws dusky-grey. The upper part of the head is glossy bluish-black, with a scarlet band on the occiput. The forehead, and a broad band under the eye, including the ear-coverts, with a narrow line over it, white, the former tinged with brown, the latter with yellow; there is a roundish patch of the same colour on the side of the neck, and an oblong one on the scapular region. The fore-neck, breast, and sides are brownish-white. A bluish-black band proceeds from the lower mandible down the side of the neck, and joins a patch of the same at its lower part. The hind-neck, back, rump, and upper tail-coverts are bluish-black, the former mottled with white. The wings are brownish-black; the inner secondary coverts white; there are, speaking generally, four bands of white spots on the outer and inner webs of the quills, some of the longer primaries having a spot more on the outer, and two less on the inner web, and the inner secondaries unspotted, but with a white tip; the first quill also is without spots, but is white towards the base on the inner web; the second has only two spots on the outer, and three on the inner web. The four middle tail-feathers are black; the two next are black at the base, but white with two black bands in the rest of their extent; the lateral feathers white in their distal half, with two black bars; the small incumbent feathers black. The abdomen and lower tail-coverts are vermilion.

Length to end of tail $9\frac{3}{4}$ inches; extent of wings 17; wing from flexure $5\frac{1}{2}$; tail $3\frac{3}{4}$; bill along the ridge $1\frac{2}{12}$, along the edge of lower mandible $1\frac{5}{12}$; tarsus 1; first toe $\frac{3\frac{1}{2}}{12}$, its claw

$\frac{4}{12}$; second toe $\frac{6}{12}$, its claw $\frac{6}{12}$; third toe $\frac{8}{12}$, its claw $\frac{7}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{7}{12}$.

Female.—The female, which is slightly smaller, has the colours distributed in the same manner; but the red on the occiput is wanting, the whole upper part of the head being glossy bluish-black, excepting the white band on the forehead.

Length to end of tail 9½ inches; extent of wings 16½; tail $3\frac{10}{12}$; wing from flexure 5½; bill along the ridge $1\frac{1}{12}$, along the edge of lower mandible $1\frac{4}{12}$; tarsus $1\frac{1}{12}$; fourth toe 1¼; horny part of the tip of the tongue ½.

Variations.—I have not met with any remarkable variations in adult specimens, beyond a little difference in the number of white spots on the quills, and black bands on the lateral tail-feathers. The lower parts are often much soiled by matters rubbed from the trees.

Habits.—The ~~Pied or~~ Greater Spotted Woodpecker is extensively distributed in England and Scotland; but in all parts is rare, although specimens are not very unfrequently obtained. It is a permanent resident, and has been found breeding in various districts. The most northern tracts in which it is met with, are the neighbourhood of Loch Ness, whence I obtained the female described above, in January 1834; the extensive fir woods on the Spey, from a specimen shot in which, in October 1836, I have taken my description of the male; and those in Braemar. In all these tracts it is not extremely unfrequent; but in other parts of Scotland it is very rarely met with. In England it has been found from the northern counties to those bordering the channel, and is more common than in Scotland, although less numerous than the Green Woodpecker. Its food consists of larvæ and insects of various kinds. The stomach of one killed in January I found filled with small white worms, some of them three-fourths of an inch long, and a line and a half in breadth, while others were scarcely an eighth of an inch in length. Its habits are similar to those of "Picus pubescens," "P. villosus," and the other variegated Woodpeckers of North America; its flight being

In the eastern half of the middle division of Scotland, I shall seen more than twenty specimens. In the Grampian South and West of Dunkeld, also, but occasionally occurs.

rapid and undulated, its motions abrupt, and its cry loud and shrill. In ascending a tree it advances by short jerks, directly or spirally, taps with its bill as it proceeds, and on finding a place likely to shelter its prey, drives off the bark, and perforates the wood. Although a person may approach it while it is actively engaged, it flies off on perceiving him, or glides round to the other side of the tree, sometimes remaining still for a time, as if to conceal itself.

Montagu states that "it rarely descends to the ground in search of food, and more frequently makes that jarring noise for which the Woodpeckers are distinguished than either of the other species, especially when disturbed from the nest, which," he continues, "we had an opportunity of observing. It was with difficulty the bird was made to quit her eggs; for notwithstanding a chisel and mallet were used to enlarge the hole, she did not attempt to fly out till the hand was introduced, when she quitted the tree at another opening. The eggs were five in number, perfectly white and glossy, weighing about one dram, or rather more. They were deposited two feet below the opening, on the decayed wood, without the smallest appearance of a nest. As soon as the female had escaped, she flew to a decayed branch of a neighbouring tree, and there began the jarring noise before mentioned, which was soon answered by the male from a distant part of the wood, who soon joined his mate, and both continued these vibrations, trying different branches, till they found the most sonorous."

Mr Harley, of Leicester, who has generously and spontaneously aided me with observations made on the birds of the midland counties, writes respecting the present species as follows:—"We have the Greater Spotted Woodpecker here also, but it is not quite so common as the Green one. It affects the deep umbrageous woods of Oakley and Piper. In Worcestershire and Herefordshire I have seen it upon the moss-grown apple trees, particularly the very aged ones. From the attention I have paid to its habits, I think I say the truth when I affirm that it affects the tops of trees more than its congener does. The common people here, who have a knowledge of the bird, call it French Magpie; and in the counties of Salop and Stafford it is called the Woodpie."

The eggs are of an elliptical form, pure white, glossy, an inch and a twelfth in length, and nine-twelfths in breadth.

Young.—When fledged, the young resemble the adult, with the following differences. The plumage is looser and less glossy; the black of the upper parts is tinged with brown; the feathers on the upper and fore part of the head are tipped with crimson; the white on the sides of the head and neck, as well as that of the scapulars and inner large wing-coverts, soiled with brown; the longitudinal dark band on the sides of the neck is narrower and blackish-brown, and the lower parts are brownish-white, while the red on the abdomen is duller and of much less extent. In this state, it has been mistaken for Picus medius.

Progress toward Maturity.—After the first autumnal moult, the young assume the colours of the adult.

Remarks.—A great number of Woodpeckers, such as Picus Canadensis, P. Martinæ, P. Harrisii, P. villosus, P. pubescens, P. querulus, P. medius, and P. minor, which resemble the present in having the upper parts black, patched with white, may equally be named Spotted Woodpeckers. The older authors, Brisson for example, named it the Larger Spotted Woodpecker, Picus varius major, to distinguish it from the other pied European species; and Linnæus, agreeably to the binary nomenclature which he employed, rejected the term varius or spotted, and gave it the specific name of major. This appellation, however, is ~~obviously inadmissible~~, as the bird is not the largest of the spotted or pied species, and much less is it the largest of the Woodpeckers in general, as the name would imply. not judiciously chosen ~~I have therefore changed the specific name to Pipra, which is said by Aldrovandi and others to have been that given it by Aristotle. It is difficult to find a good English name for it, but that which I have employed may answer our purpose, and has the advantage of not being new. The name "Red-bellied," which might distinguish it from our other species, has been given to an American Woodpecker, and I am acquainted with eight or ten species which are equally red beneath.~~

2. Dendrocopus minor. Linn. The Lesser Spotted Woodpecker.

~~PICUS STRIOLATUS. THE STRIATED WOODPECKER.~~

~~LESSER SPOTTED WOODPECKER.~~ HICKWALL. CRANKBIRD.



FIG. 205.

Picus minor. Linn. Syst. Nat. I. 176.
Picus minor. Lath. Ind. Orn. I. 229.
Pic épeichette. Picus minor. Temm. Man. d'Orn. I. 399.
Lesser Spotted Woodpecker. Mont. Orn. Dict.
Picus minor. Lesser Spotted Woodpecker. Selb. Illustr. I. 379.
Picus minor. Lesser Spotted Woodpecker. Jen. Brit. Vert. An. 151.

brownish-white

Male with the forehead white, the crown ~~*crimson*~~ scarlet, *margined with black, the back and scapulars transversely barred with black and white; sides of the head and neck white, with a black band; lower parts brownish-white, breast and sides with longitudinal dusky lines. Female similar, but with the crown white.*

MALE.—This species, which is of less frequent occurrence than the last, being confined to the southern and middle parts of England, is much inferior in size to that species, its length being ~~little more~~ than ~~five~~ six inches. The bill is short, tapering, with the point bevelled and abrupt; the lateral ridges of the upper mandible nearer the margins than the central ridge. The head is rather large, ovato-oblong; the neck short; the feet short, ~~with~~ the outer toe ~~about the same length as~~ considerably longer than the third; (the tarsi feathered in front more than half way down.

the claws strong, well arched, and very acute. The plumage is soft and blended; the wings large, broad, rounded, with nineteen quills, of which the first is very small, the fourth longest; the tail ~~rather short~~, rounded, of twelve feathers, the lateral small and incumbent, the rest with strong shafts and emarginate tips.

The bill is greyish-blue, darker at the end; the iris reddish-brown; the feet leaden-blue, the claws ~~dusky~~. The forehead brownish-white; the crown of the head ~~crimson~~, with a black band on each side, the occiput of the latter colour; the sides of the head and neck are white, with a black band from the lower mandible to the wing; the rest of the lower parts brownish-white, the breast and sides longitudinally streaked with ~~dusky~~. The hind-neck and fore part of the back are glossy black; the ~~rest~~ middle of the back and the scapulars transversely barred with black and white; the wings black, the secondary coverts with two white bands, the quills marked with white spots on both webs, except the first which has the inner web white ~~at the base~~; the four middle tail feathers black, the rest white toward the end, the third from the centre with the tip obliquely white, the next with two black bars on the inner webs, the outer with three bars on ~~both webs~~, the small incumbent feathers black, with a white spot on the outer web. Length to end of tail 5~~4~~ inches; extent of wings ~~10~~; bill along the ridge $\frac{7}{12}$, along the edge of lower mandible $\frac{8}{12}$; wing from flexure 3$\frac{1}{2}$; tail 2$\frac{4}{12}$; tarsus $\frac{7}{12}$; hind toe $\frac{3}{12}$, its claw 2$\frac{1}{2}$; second toe $\frac{4}{12}$, its claw $\frac{4}{12}$; third toe $\frac{5}{12}$, its claw $\frac{5}{12}$; reversed toe $\frac{5}{12}$, its claw $\frac{5}{12}$.

Female.—The female differs from the male in having the upper part of the head white, and in being somewhat less.

Habits.—This species, which is said to be more abundant in the northern parts of Europe than in France and Germany, has not hitherto been met with in Scotland, or even in many parts of England, although it occurs in most of the southern, eastern, and midland counties, extending as far north as Derby, and westward to Shrewsbury and Hereford. It is said by several

observers to be not uncommon in some districts. Thus, Mr Gould, in his beautiful Illustrations of the Birds of Europe, says, "In England it is far more abundant than is generally supposed; we have seldom sought for it in vain wherever large trees, particularly the Elm, grow in sufficient numbers to invite its abode: its security from sight is to be attributed more to its habit of frequenting its topmost branches than to its rarity." The Reverend Mr Bree states that "it is by no means of rare occurrence in his neighbourhood, where, however, it is more readily heard than seen. Its loud, rapid, vibratory noise, most extraordinarily loud to be produced by so small an animal, can hardly fail to arrest the attention of the most unobserving ear. Though I have watched the bird during the operation, and within the distance of a few yards, I am quite at a loss to account for the manner in which the noise is produced. It resembles that made by the boring of a large auger through the hardest wood; and hence the country people sometimes call the bird the 'pump-borer.'" Mr Dovaston informs us that it is a very frequent, but uncertain, visitor to the woods near Shrewsbury, never failing in April to astonish him "with his prodigiously loud churr on the ranpikes of trees, which, the atmosphere being favourable, may be heard more than a mile. It much resembles the snorting of a frightened horse, but louder and longer." He then states that the bird, in performing this sound, "vibrates its beak against the tree; the motion is so quick as to be invisible, and the head appears in two places at once. It is surprising and to me wondrously pleasing, to observe the many varieties of tone and pitch in their loud churry, as they change their place on boughs of different vibration, as though they struck on the several bars of a gigantic staccato. When actually boring they make no noise whatever, but quietly and silently pick out the pieces of decaying wood, which, lying white and scattered beneath on the ground and plants, leads the eye up to their operations above. They have several favourite spots, to which they very frequently return. Their voice is a very feeble squeak, repeated rapidly six or eight times, *ee, ee, ee, ee, ee.* They bore numerous and very deep holes in decayed parts, where they retire to sleep early in the

Lesser Spotted—

evening ; and, though frequently aroused, will freely return. Whatever be the purpose of this enormous noise, they certainly do very nimbly watch, and eagerly pick up, the insects they have disturbed by it. They fly in jerks like their congeners, and always alight on the side of a tree." These notices are extracted from the earlier volumes of Mr Loudon's Magazine of Natural History, a work replete with information respecting our native birds.

Mr Harley informs me that it occurs about Leicester, but is not a resident all the year round, as are the Green and Greater Spotted Woodpeckers, remaining only during the vernal, summer, and part of the autumnal months.

Montagu states that it has all the habits of the Greater Spotted Woodpecker, as well as a similar but less strong note. " The eggs are white, and weigh about thirty-three grains ; five of them we took out of a decayed tree, deposited on the rotten wood, without any nest, and at a considerable distance below the entrance. The aperture corresponded with the size of the bird, but did not appear recently made. It is probable, however, it is able to perform this work for itself; and instinct points out the insecurity in making choice of a larger opening to their place of incubation, as they would then be liable to be dislodged by the larger species, the daw, and the stare."

This curious little bird appears to be peculiar to Europe, where it is generally distributed. It usually prefers the higher branches of trees, although it by no means confines itself to them, and is so intent on searching for its food that it pays little regard to a person coming to watch or shoot it. Like the other species, however, as well as the Creeper, if it perceive its observer, it moves round to the other side of the branch to conceal itself. The loud noise above described is supposed by some to be an amatory performance, as it is heard only or chiefly in spring, while others conjecture it to be produced by a rapid tapping of the bill, for the purpose of disturbing insects that are lodged in the bark. This latter opinion is more probable, for in spring it besides emits its ordinary notes so much more frequently and loudly than usual, that they may well pass for a love song.

Dendrocopus minor.

All that I have here given respecting its habits is downright compilation, for, if I have ever seen the bird alive, I have no recollection of its having afforded me any information.

Young.—When fledged, the young are similar to the adult, the males, according to Montagu, having the red on the head before they leave the nest.

Remarks.—Although a small bird, this is by no means the smallest of even the Pied or Spotted Woodpeckers, and therefore ~~I have changed its name to *striolatus*~~, expressive of the manner in which its breast and sides are marked.

it ought not to be named Picus minor. An excellent name would be Striolatus, as being

A small Woodpecker, Picus villosus, intermediate in size between the present and the last, but with the upper part of the head in the male black, with a transverse red occipital band, and a white streak over the eye, the red band wanting in the female, has been stated to have been shot near Halifax in Yorkshire. It is supposed, however, that the specimens had come from Halifax in North America. Its habits, according to Mr Audubon, are similar to those of our own species. It is found at all seasons in the woods, orchards, and fences; feeds on larvæ, insects, seeds of maize, grapes, and other fruits; breeds in holes which it bores in trees, laying from four to seven eggs; and emits a sharp loud note, as well as a rolling noise similar to that produced by the other small species.

According to Donovan, Picus tridactylus of Linnæus has been shot in the north of Scotland, but I am not aware of its having been met with in any part of Britain.

Genus III. Gecinus. Green-Woodpecker.

1. Gecinus

~~PICUS~~ VIRIDIS. THE GREEN-WOODPECKER.

Common

HEWHOLE. WOODWALL. WOODSPITE. YAFFLER. YAPPINGALE. POPINJAY. RAINBIRD.

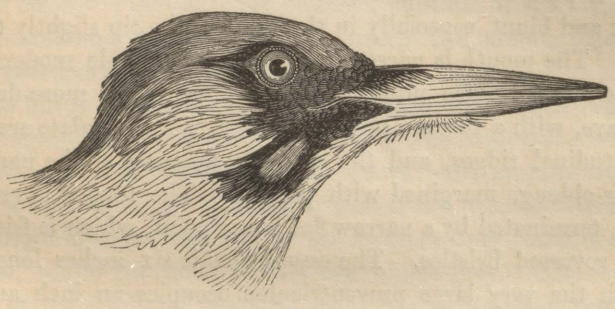


FIG. 206.

Picus viridis. Linn. Syst. Nat. I. 175.
Picus viridis. Lath. Ind. Orn. I. 234.
Green Woodpecker. Mont. Orn. Dict.
Pic vert. Picus viridis. Temm. Man. d'Orn. I. 391.
Green Woodpecker. Picus viridis. Selb. Illustr. I. 372.
Picus viridis. Green Woodpecker. Jen. Brit. Vert. An. 148.

Male with the upper parts yellowish-green, the rump greenish-yellow; the upper part of the head and hind-neck crimson, the loral and orbital spaces, and a mystachial band, black, the latter with a crimson patch; the lower parts pale greenish-yellow, tinged with grey, faintly barred behind with dusky. Female similar, but without red on the cheek. Young greyish-green above, the upper part of the head grey, spotted with crimson, the lower parts greenish-white, transversely barred with dusky.

MALE.—The Green Woodpecker, which is about the size of a Jay, and remarkable for its lively colours and great activity, is of a moderately stout and rather elongated form, with the

Gecinus viridis.

neck of ordinary length, and the head ovato-oblong and rather large. The bill is longish, somewhat slender, straight, angular, and tapering. The upper mandible has the dorsal outline slightly convex, the ridge sharp, the sides sloping, the elevated longitudinal line from over the nostrils distinct and close upon the ridge, the edges sharp and slightly overlapping, the tip vertically truncate and laterally bevelled. The lower mandible has the angle long and narrow, the dorsal line straight, the sides sloping upwards and a little convex, the edges inflected, thick and blunt, especially in the middle, the tip slightly truncate. The mouth is narrow; the upper mandible moderately concave, with three prominent lines; the lower more deeply concave, with a median prominent line. On the palate are two longitudinal ridges, and the posterior aperture of the nares is linear-oblong, margined with papillæ. The tongue is vermiform, terminated by a narrow flat horny point, which is fringed with reversed bristles. The œsophagus is six inches long, of which the very large proventriculus occupies an inch and a quarter; the stomach roundish, rather small, an inch in diameter, somewhat compressed; its muscular coat thin, its cuticular lining slightly rugous; the intestine twenty inches long, its duodenal portion five-twelfths in width; no cœca; the cloaca very large.

The eyes are rather small, their aperture three and a half twelfths in diameter. The nostrils oblong, two twelfths and a quarter long, and covered over by the reversed bristly feathers of the moderately large nasal membrane. The external aperture of the ear is transversely oblong, its greatest diameter four-twelfths. The tarsus is very short, feathered anteriorly about a third down, with six scutella, behind with numerous scales. The first toe is very small, and directed outwards and backwards, with six scutella, the second of moderate length, united to the third as far as the second joint, and having ten scutella; the third much longer, with fifteen scutella; the fourth a little shorter than the third, directed outwards and backwards, with twelve scutella. The claws are much arched, deep, greatly compressed, broadly grooved on the sides, and extremely acute; the first smallest, the third largest, the second larger than the fourth.

The plumage is soft and blended; the feathers ovate, with a rather large plumule; those of the nasal membrane stiff, bristly, and directed forwards; of the head ovate and downy, with a narrowed stiff glossy extremity. The wings are rather long, broad and rounded; the quills nineteen; the primaries tapering to a roundish point, the secondaries broad and rounded; the first quill less than a third of the length of the longest, the second one inch shorter than the third, which is two and a half twelfths shorter than the fourth, the fifth almost as long as the latter. The tail is rather short, cuneate, of ten feathers, all pointed and slightly decurved, except the lateral, together with two small incumbent feathers.

The bill is greyish-black, the lower mandible with a yellowish longitudinal band near the base. The irides are white. The feet are dull bluish-grey, the claws light greyish-brown, with a tinge of blue. The upper part of the head and the nape are bright crimson, the tips of the feathers only being of that colour, while the downy parts are bluish-grey. The lower part of the forehead, the loral space, the parts about the eye, at the base of the lower mandible, and a mystachial band, black, but the latter having a patch of crimson. The upper parts in general are yellowish-green, the rump and upper tail-coverts greenish or lemon-yellow; the wing-coverts of a somewhat less pure green, being slightly tinged with brown. The edge of the wing is white; the alula, primary coverts and primary quills greyish-black, their outer webs, excepting towards the end, barred with yellowish-white, the inner with transversely oblong white spots; the secondaries and their coverts barred with whitish, but that colour not apparent externally, the outer webs being green, with faint light spots, as are the margins of the primaries at the base, except on the outer three. The tail is dusky, faintly barred with brownish or greenish-white, the margins greenish-yellow. The lower parts are pale greenish-yellow, tinged with grey, the throat and sides lighter; the abdomen, and part of the sides, and lower tail-coverts, faintly undulated with dusky.

Length to end of tail 13½ inches; extent of wings 21; wing from flexure 6½; tail 4¼; bill along the ridge $1\frac{9}{12}$, along the

edge of lower mandible $1\frac{10\frac{1}{2}}{12}$; tarsus $1\frac{2}{12}$; first toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{4}{12}$; second toe $\frac{8}{12}$, its claw $\frac{9}{12}$; third toe 1, its claw $\frac{10}{12}$; fourth toe $\frac{10}{12}$, its claw $\frac{8}{12}$.

Female.—The female differs little from the male. The mystachial band is entirely black; the red extends less along the hind-neck; and the lower parts are of a more yellowish grey.

Length to end of tail 13 inches; extent of wings 21; wing from flexure $6\frac{5}{12}$; tail $4\frac{1}{2}$; bill along the ridge $1\frac{8}{12}$; tarsus $1\frac{2}{12}$; middle toe 1, its claw $\frac{9}{12}$.

Variations.—In adult birds I have not observed any remarkable variations; but it is stated that individuals of a white or whitish colour are sometimes met with.

Changes of Plumage.—The plumage is completed by the end of autumn, when the tail-feathers are acuminate, but rounded, the shaft suddenly attenuated. When worn by use, they present the appearance of being slit at the extremity, the barbs extending beyond the tip of the shaft.

Habits.—The Green-Woodpecker does not occur in any part of the northern or middle divisions of Scotland. None of the birdstuffers in Edinburgh with whom I am acquainted have ever had a recent specimen; and if it exist in the southern parts of that country, it must be extremely rare. Speaking of the valley of the Clyde, which is remarkably well adapted for Woodpeckers, the Reverend Mr Patrick says expressly, "No species of Picus or Woodpecker has ever been observed in this part of Scotland;" and I have had no success in my endeavours to find a locality for the Green Woodpecker north of the Tweed. Mr Yarrell, I think, must have somehow erred in alleging it to be "found over a great portion of, if not all, the wooded districts of England and Scotland." Even in the north of England it is of very uncommon occurrence, but as we proceed southward it increases in frequency, and in some districts, especially the southern and midland, is by no means

uncommon. It is permanently resident, and does not appear to shift its quarters much, remaining at all seasons in the woods, and occasionally betaking itself to orchards and gardens. Its flight is rapid and undulated, when protracted, and all its motions are lively and indicative of great vigour.

It ascends in a vertical or spiral direction the trunks and branches of trees, tapping with its bill as it proceeds, to discover the parts in which the bark or wood is decayed. Having found a place likely to yield a supply of food, it strikes the bark smartly, or drives it off with repeated blows, and seizes by means of its exsertile tongue the insects that have been disturbed in their retreat. The decayed and worm-eaten wood it perforates for the same purpose, its food consisting not only of coleopterous insects, but of larvæ of all kinds that harbour in trees, and especially of that of the Cossus ligniperda, the disagreeable smell of which is said to be frequently communicated to it. Often in summer and autumn it betakes itself to the ground, to search for insects, and particularly ants and their eggs, which it picks up with its clammy tongue, after demolishing the nests with its bill. It is even said by some to extend its tongue in the paths of the ants, and when several of them have adhered to it, to retract it. Should this statement be correct, it might, in the estimation of the analogical ornithologists, entitle the Woodpeckers to hold a station parallel to the edentulous anteaters among the mammalia!

It is thought to announce the approach of rain by a peculiar cry, which may be likened to the syllables *pleu-pleu*; but its ordinary note is rather harsh, and in the breeding season it emits a noise resembling a shout of laughter, whence its name Yaffler. In spring, like the other species, it produces a remarkable sound, which has been considered an intimation to its mate, by tapping with its bill, strongly and rapidly, on some decayed and sonorous branch, thus causing a noise that may be heard in calm weather to a great distance. About the beginning of April, having paired, it begins to prepare a place for the reception of its eggs, by digging into the decayed wood of a beech, elm, or other tree, a hole, which is carried obliquely downwards to the depth of more than a foot, being at the mouth perfectly round and

just sufficient to admit the body, but at the lower part enlarged. Both the male and the female work alternately, and when the cavity is completed, it receives no lining of straws or feathers, but the eggs, to the number of five, of an elliptical form, white, an inch and a quarter in length, are deposited on the bare wood. The young often leave the nest before they are able to fly, creep along the stem and branches, and return to it at night.

In winter it is often seen in the neighbourhood of houses, and betakes itself for repose to hollow trees. At all seasons it is shy, although when busily engaged in searching for food, it will allow a person to approach very near it. In autumn, when it is fat, it is frequently eaten, and is sometimes seen in the markets, although usually its flesh is rank and tough.

Mr Harley, of Leicester, has favoured me with the following characteristic account of its habits, as observed in his neighbourhood. "The ornithologist desirous of becoming acquainted with the habits of the Green Woodpecker in this part of the country, must repair to the hedge-row tree, the elm, the decayed ash, and the ranpikes of the solitary forest oak, and not to the verdant shades of Grooby or Newtown, or the more impenetrable woods of Sheet Hedges. It sometimes approaches the habitations of man, and I have seen it within a few yards of the buildings of our populous town. On the 16th of April 1834, at five o'clock in the morning, I had a good view of a pair of these birds, as they were at work on an ant-hillock, at the foot of some lofty elms. I remarked the loud sonorous note of the male to proceed from him equally when on the hillock as when on the bole of the tree, to which both he and his partner always resorted when the least danger was apparent, or any unusual noise was made.

"The elm is the most common tree within a few miles round Leicester, and on its bark the Green Woodpecker appears happy and at home. Its flight is undulating, but the last undulation, before the bird alights on the bole of the tree, is much longer than the first. I have never seen it descend the tree after the manner of the Nuthatch, nor have I reason to think that it ever does so. Some authors, in their history of this bird, speak of its carrying away the chips from the foot of

the tree in which it has been preparing a place for its offspring; but, although such may be the case, I have never, after a very minute search, seen either male or female removing the chips, which, on the contrary, I have always found in profusion near their holes. This bird never uses masonry, as the Nuthatch does, at the mouth of the holes which it chooses for nidification. I have never found any appearance of nest, excepting the decayed wood, on which were laid from five to seven delicate and beautiful white eggs.

"I am not aware of any seasonal difference in the note of the male, save and except in the vernal months, when he is more clamorous, and much more frequently repeats his shout. The loud laugh, the *plui-plui-plui* is the same, not varying in cadence, throughout the spring, and perhaps the summer months. I never saw it scratch when on the ground, even on the most sandy soils, but I have repeatedly noticed it thrust its powerful bill into the ant-hillocks, after the manner of the Rook, and most probably to obtain the eggs as well as the perfect ants. This habit of the bird will account for its bill being often found covered with earthy and miry substances."

On the continent, it is said to be generally dispersed, from the Scandinavian peninsula to Greece; and, according to Professor Jameson, occurs in the Himalayan range.

Young.—When fully fledged, the young resemble the adult, with the following differences:—the upper parts are of a duller green, each feather on the back with a yellowish-white spot, and the tip pale; those of the rump and the tail-coverts barred with dusky and yellowish-white; the feathers of the head are bluish-grey, with a dusky bar, and the tip crimson; the lower parts are dull yellowish-white, transversely undulated with dusky; the sides of the head and fore-neck streaked with dusky, and the mystachial band small, and brownish-black, with small white spots.

Linn.

Genus IV. YUNX. WRYNECK.

Bill shortish, slender, straight, tapering, acute, rather broader than high at the base; upper mandible with its dorsal outline almost straight, the ridge very narrow at the base, convex towards the end, the sides sloping, but towards the end convex, the edges sharp and sloping, the tip acute, without notch or sinus; lower mandible with the angle very long and rather narrow, the dorsal outline ascending and straight, the sides sloping outwards and flat, the edges inflected, thick and blunt, the ridge convex, the tip acute; the gape-line straight.

Mouth rather narrow; the upper mandible concave, with a central prominent line, the lower more deeply concave, with a similar line. Tongue extremely extensile, vermiform, with its terminal part horny, flat, and tapering, without bristles.

Nostrils linear in the upper edge of the membrane, filling up the large anteriorly rounded nasal groove, and anteriorly bare. Eyes of moderate size. Aperture of the ear large and roundish.

The general form rather slender; the neck short; the head oblong, flattened in front. The feet short, and rather slender; the tarsus feathered anteriorly a little below the joint, compressed, with seven anterior broad scutella, and an equal number of smaller ones behind. Toes two before, parallel, and united at the base; two behind; the first very small, and much more slender than the rest, the fourth directed backwards, and almost as long as the third. Claws of moderate length, arched, extremely compressed, broadly grooved on the sides, acute.

Plumage very soft and blended; the feathers of moderate length, ovate, and rounded. Wings moderately long, straight, rather acute, of twenty rounded feathers; the first quill extremely small and acute; the third longest; the second almost as long, the other primaries gradually diminishing. Tail rather

long, straight, rounded, of ten broad rounded feathers, of ordinary structure.

The genus Torquilla has generally been associated with the genus Picus, to which it undoubtedly bears a great affinity. The extensibility of the tongue is the principal common character, but that organ differs in being barbed in the one genus and smooth in the other. The fourth toe in the Picinæ is directed somewhat outwards and backwards, whereas in Torquilla its natural position is directly backwards, parallel to the first. The bill in Torquilla, however, more closely resembles that of the Picinæ than of the Cuculinæ, although it is not wedge-shaped at the point. On the other hand, the tail has no resemblance to that of the Woodpeckers. In truth, the genus stands on the limits of the two groups, and forms their connecting link. The common or European species is the only one with which I am acquainted, so that the above generic character has been taken from it exclusively. It appears that there is only another species as yet known, which is a native of Southern Africa, and has been named Yunx pectoralis by Mr Vigors.

M. Temminck states that "the first quill is a little less long than the second, which is the longest;" Mr Selby that "the first feather is a little shorter than the second, which is the longest in the wing;" and Mr Jenyns that "the first quill is a little shorter than the second, which is longest." The first quill I find extremely short, being about a sixth only of the length of the second, which is very slightly shorter than the third.

Linn. Common

1. YUNX TORQUILLA. THE WRYNECK.

EMMET-HUNTER. LONG-TONGUE. CUCKOO'S MAID OR MATE. SNAKE-BIRD. BARLEY-BIRD. TURKEY-BIRD



Fig. 207.

Yunx Torquilla. Linn. Syst. Nat. I. 172.
Yunx Torquilla. Lath Ind. Orn. I. 223.
Wryneck. Mont. Orn. Dict.
Torcol ordinaire. Yunx Torquilla. Temm. Man. d'Orn. I. 403.
Wryneck. Yunx Torquilla. Selb. Illustr. I. 381.
Yunx Torquilla. Wryneck. Jen. Brit. Vert. An. 152.

Plumage of the upper parts brownish-grey, spotted, undulated, and dotted with blackish-brown; a longitudinal band of dark brown on the hind-neck; the fore-neck and sides greyish-yellow, with transverse narrow bars of brownish-black.

Male.—The Wryneck is one of the most beautiful of our native birds, being of an elegant form, and having its colours, which however are not brilliant, disposed in a curiously intricate manner. As it is the only species of the genus that occurs in this country, or indeed in Europe, it is unnecessary to describe those parts which have supplied materials for the generic character. Unfortunately I have neglected the examination of the intestinal canal; and my note-books supply descriptions of the exterior only.

The bill, feet, and claws are pale greyish-brown; the iris light brown. The upper parts are brownish-grey, with small transverse pointed spots, and numberless undulated dots of blackish-brown, and greyish-white markings. A broad band of elongated brownish-black spots extends from the occiput to the middle of the back. The tail, which is dotted and mottled like the back and wings, has five transverse undulated bands of brownish-black, the last narrowest and subterminal. The quills are brown, marked on the outer webs and inner margins with broad bars or spots of pale red. The fore part and sides of the neck are pale greyish-yellow, marked with transverse narrow bars of brownish-black; the sides of the body similarly coloured; the breast paler or whitish, with fewer sagittate dusky spots; the lower tail-coverts yellowish-white, with transverse bars of dusky.

Length to end of tail 7 inches; extent of wings 11, bill along the ridge $\frac{6}{12}$, along the edge of lower mandible $\frac{8}{12}$; wing from flexure $3\frac{7}{12}$; tail $3\frac{1}{12}$; tarsus $\frac{9}{12}$; first toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; second toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; third toe $\frac{8\frac{1}{2}}{12}$, its claw $\frac{4\frac{1}{2}}{12}$; fourth toe $\frac{7\frac{1}{2}}{12}$, its claw $\frac{4\frac{1}{2}}{12}$.

Female.—The female differs very little from the male, the tints being merely somewhat duller, and the longitudinal band on the neck and back of less extent. An individual shot about eight miles from Edinburgh, in the beginning of May 1824, was as follows. Bill and feet pale brownish-grey. The upper parts brownish-grey, with transverse markings of blackish-brown and whitish, the latter terminal; the whole plumage minutely dotted; a line of brownish-black spots from the occiput to the middle of the back; a few roundish spots of whitish on the wing-coverts; tail yellowish-grey, barred with five undulated black bands; the quills brown, their outer webs and inner margins with a broad bar of pale red; the fore-neck and sides pale greyish-yellow, transversely barred with brownish-black, the rest of the lower parts yellowish-white, with triangular dark spots, excepting the lower tail-coverts, which are similarly barred.

Length to end of tail $6\frac{3}{4}$ inches; extent of wings 11; bill along the ridge $\frac{1}{2}$; tarsus $\frac{6}{8}$; third toe and claw $1\frac{1}{12}$.

Habits.—The Wryneck arrives from the middle to the end of April, generally preceding the Cuckoo, to which it is nearly allied in form if not in habits, and disperses over the country, extending northward as far as the middle division of Scotland, in which country, however, it is extremely rare. The late Mr George Carfrae brought me for examination one shot near Currie, in Mid-Lothian, in May 1824, and his brother Mr Macduff Carfrae obtained a specimen from Fifeshire in 1835. In many of the southern, eastern, and midland districts of England, it is not very uncommon, but according to Montagu is of rare occurrence in the western parts.

This beautiful bird seems to be precisely intermediate between the Woodpecker and the Cuckoo, but in its habits and the structure of its tongue it is more allied to the former. That organ is slender, with a horny point, and is capable of being thrust out to a great length in consequence of the extreme elongation of the horns of the hyoid bone, which curve over the head and extend to the base of the upper mandible. Two long salivary glands, situated beneath the tongue, open into the mouth by two ducts, and pour forth a copious viscid fluid, which covers the tongue, and thus causes insects, larvæ, ants and other small objects forming the food of this species to adhere to it, when it is ejected for the purpose. "We were enabled," says Montagu, "to examine the manners of this bird minutely by taking a female from her nest, and confining her in a cage for some days. A quantity of mould with emmets and their eggs were given to it; and it was curious to observe the tongue darted forward and retracted with such velocity, and with such unerring aim, that it never returned without an ant or an egg adhering to it, not transfixed by the horny point, as some have imagined, but retained by a peculiar tenacious moisture, by nature provided for that purpose. While it is feeding the body is motionless, the head only is turned to every side, and the motion of the tongue is so rapid that an ant's egg, which is of a light colour, and more conspicuous than the

tongue, has somewhat the appearance of moving towards the mouth by attraction, as a needle flies to a magnet. The bill is rarely used except to remove the mould in order to get more readily at these insects; where the earth is hollow, the tongue is thrust into all the cavities to rouse the ants; for this purpose the horny appendage is extremely serviceable, as a guide to the tongue. We have seen the Green Woodpecker take its food in a similar manner; and most probably every species of that genus does the same."

"Shy and unusually timid," says Mr Knapp, "as if all its life were spent in the deepest retirement, away from man, it remains through the day on some ditch-bank, or basks with seeming enjoyment, in any sunny hour, on the ant hills nearest to its retreat; and these it depopulates for food, by means of its long, glutinous tongue, which, with the insects, collects much of the soil of the heaps, as we find a much larger portion of grit in its stomach than is usually met with in that of other birds. When disturbed, it escapes by a flight precipitate and awkward, hides itself from our sight, and, were not its haunts and habits known, we should never conjecture that this bustling fugitive was our long-forgotten spring visitant, the Wryneck."

But although it thus frequents the ground in quest of food, it also searches the trunks and branches of trees, and has been observed clinging to walls. "I once," says a correspondent in the Magazine of Natural History, Vol. IV, p. 450, "saw it climb the perpendicular face of an old tall wall in the botanic garden at Bury St. Edmund's; it was seeking either insects or grit, and proceeded as if in neither haste nor fear, but uttered its hawk-like note at intervals." This note is a shrill cry, which has been compared to the scream of the Kestrel, and which is more frequently heard in the earlier period of its sojourn with us.

From its appearing about the same time as the Cuckoo, it is named in various parts of England, the Cuckoo's mate, maid, attendant, or messenger. The name of Wryneck is derived from its habit of moving its head and neck in various directions, and probably was originally Writheneck, corresponding

to Torquilla and Torticollis. When surprised in its nest, it is described as making a hissing noise, which some compare to that of a Turkey-cock, others to that of a snake, erecting the feathers of its head, which it moves to either side, stretching itself at full length, and sometimes so frightening the intruder as to make its escape. It has thus obtained the names of Snake-bird and Turkey-bird.

The nest is merely the rounded bottom of a cavity or hole in a tree, which the bird adapts to its purpose by means of its bill, the small chips of wood answering in place of straw or feathers. The eggs, which are generally seven or eight in number, are pure white, ten twelfths of an inch in length, and seven twelfths in their greatest breadth.

"The Wryneck," says M. Manduyt, "is remarkable for the habit which has given it its name, that of twisting the neck with a slow undulatory movement, like that of a snake, turning its head back and closing its eyes. When caught, it never ceases this motion, which it also performs when at liberty, and even the young, while yet in the nest, have the same habit. If one should go near a male Wryneck confined in a cage, it immediately ruffles up the feathers of its head, spreads out those of the tail and raises them, advances and retires, striking the bottom of the cage with its bill."

It is said to be generally distributed on the Continent, and to be common among the Himalayan Mountains.

Young.—The young when fledged are coloured in the same manner as their parents.

Family II. CUCULINÆ. Cuculine Birds.

~~CUCKOOS AND ALLIED SPECIES.~~

The Cuculinæ differ from the other families of the Volitatorial group in having two of their toes directed backwards.

~~Of the extensive series of zygodactylous birds, the most isolated groups seem to be the Parrots and Woodpeckers, which might therefore be considered as forming two distinct orders.~~ Feet of this kind are not necessarily scansorial, and as will known we have seen that the more or less syndactylous feet of Creepers and Nuthatches are as well adapted for climbing as ~~those~~ the zygodactylous feet of Woodpeckers; large, well-curved, much compressed, and extremely acute, short-tipped claws, whether two only or three of the toes be directed forwards, forming the essential characteristic of a scandent foot. Now many of the zygodactylous

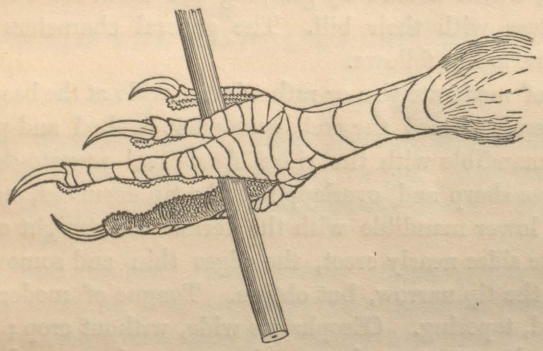


Fig. 208.

birds have the feet somewhat differently formed from those of the Woodpeckers, inasmuch as the toes are very broad and flat beneath, so as evidently to be formed for grasping a branch or twig with security, while the claws are not very different from those of ~~the Vagatores and~~ other perching birds; and in some the toes and tarsi are so very small and feeble that they could not support a bird in climbing. These latter, such as the

Jacamars, may be referred to the aerial birds, or those which fly chiefly in procuring their food, but neither climb nor walk much; and the Cuckoos and Anis may be considered as forming an order, to which, however, I refrain from giving a name, because I have not studied the manners of more than a single species, nor read a good account of any other than the three that occur in North America. The digestive organs of these four species are very similar to those of the Owls, and their cœca are large, while those of the Woodpeckers and Toucans are entirely wanting. are certainly not scansorial in any sense.

The Cuculinæ form a pretty extensive family of birds, generally inhabitants of the warmer regions of the globe, and of which none permanently reside in countries subject to severe winter cold. They feed on insects, worms, and soft fruits, in procuring which they glide among the twigs and foliage, leaping from branch to branch, but never climbing in the manner of Woodpeckers or Creepers, nor even after the fashion of Parrots, which ascend by grasping the branches and aiding themselves with their bill. The general characters of the Cuculinæ are as follows.

Bill of moderate size or rather large, wide at the base, much compressed toward the end, somewhat arched and pointed; upper mandible with the ridge obtuse and arcuato-declinate, the edges sharp and overlapping, the tip decurved, notchless, acute; lower mandible with the dorsal line straight or decurvate, the sides nearly erect, the edges thin and somewhat involute, the tip narrow, but obtuse. Tongue of moderate size, flattened, tapering. Œsophagus wide, without crop; proventriculus large; stomach very large, round, somewhat compressed; its muscular coat thin, the epithelium soft and rugous; intestine of moderate length and width, with large oblong cœca. Pl. XV. Trachea with a single pair of inferior laryngeal muscles. Nostrils linear, oblong, or circular, direct, in the short bare nasal groove. Eyes of moderate size. Feet short, of moderate strength; tarsus short, with a few very large anterior scutella, edged behind with two series of scales. Toes four, scutellate,

broad beneath; first small; second shorter than fourth, and united at the base with the third, which is very long; the fourth or outer reversed so as with the first to oppose the rest in grasping; claws moderate, compressed, curved, acute.

Plumage moderately full, generally compact, but various; the feathers ovate, with a very short plumule, but having the downy filaments numerous and close. Wings long or of moderate length, much rounded, the first quill short, the third and fourth longest. Tail long, ample, graduated or rounded, generally of twelve broad, rounded feathers.

In their digestive organs the Cuculinæ bear a striking resemblance to the Owls and Goatsuckers. They are for the most part of an elongated form, having the body rather slender, the neck short, the head rather small and oblong, the tail very long, and the wings in no instance short. They fly with ~~rapidity~~, quickness, glide among the foliage with ~~great~~ celerity, advance among the twigs with ease, but on the ground walk in an awkward manner, on account of the shortness of their tarsi.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. CUCULUS. CUCKOO.

Bill of moderate length, rather slender, arcuato-declinate. Nostrils roundish, with a prominent margin. Feet very short, slender; tarsi feathered more than halfway down. Wings and tail very long.

1. *Cuculus canorus. Grey Cuckoo.* Bluish-grey above, fore part and sides of neck ash-grey; body beneath transversely barred with white and dusky. Young with the upper parts barred with light-red and brown, the lower with brownish-white and dusky.

2. ~~Genus II. Dryolophus.~~ *Cuculus glandarius. Great Spotted Cuckoo.*

GENUS ~~III.~~ II. COCCYZUS. COWCOW.

Bill of moderate length, slender, arcuato-declinate. Nostrils linear. Feet very short, slender; tarsi bare. Wings of moderate length; tail very long.

1. *Coccyzus Americanus. Yellow-billed Cowcow.* Upper parts greyish-brown tinged with olivaceous; lower silvery white.

Greyish-black above, wing-coverts, secondary quills, and tail-coverts tipped with white; head dark grey, crested; lower parts white.

Genus I. CUCULUS. CUCKOO. Linn.

Bill of moderate length, rather slender, arcuato-declinate, broader than high at the base, compressed toward the end, acute; upper mandible with the dorsal line arcuato-declinate, the ridge narrow but obtuse, the sides sloping at the base, convex toward the end, the edges sharp, with a slight sinus close to the declinate, acute tip; lower mandible with the angle short, the dorsal line slightly decurved, the ridge rather narrow, the sides sloping outwards, toward the end convex, the edges thin, the tip narrow and obtuse; the gape-line arcuate.

Tongue rather short, slender, thin, emarginate and minutely papillate at the base, the tip acute. Œsophagus wide, tapering; proventriculus rather large; stomach large, round, with the muscular coat very thin, and composed of large flattened fasciculi; the cuticular lining soft and rugous; intestine of moderate length, rather wide; cœca large, oblong.

Nostrils elliptical, with a prominent margin. Eyes of moderate size. Feet very short; the tarsus feathered halfway down, anteriorly scutellate, scaly behind, and rather sharp. Toes small, broad beneath; the first very small, the third longest; the fourth longer than the second, and reversed. Claws rather small, arched, much compressed, laterally grooved, rather acute.

Plumage soft and blended; the feathers ovate, with a short plumule; those on the rump elongated and rather stiff. Wings long, straight, and pointed, with twenty quills; primaries tapering and rounded, the first a third shorter than the second, the third longest; secondaries short, broad, abrupt, the inner rounded. Tail long, graduated, of twelve rounded feathers.

This genus is especially remarkable for containing birds which deposit their eggs in the nests of other and smaller birds of various genera, leaving them there to be hatched, and thus committing their offspring to the care of strangers. Only one species visits this country in summer.

Linn.

1. CUCULUS CANORUS. THE GREY CUCKOO.

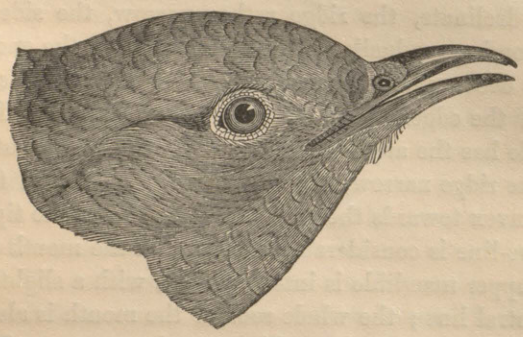


Fig. 209.

Cuculus canorus. Linn. Syst. Nat. I. 168.
Cuculus canorus. Lath. Ind. Orn. I. 207.
Common Cuckoo. Mont. Orn. Dict.
Coucou gris. Cuculus canorus. Temm. Man. d'Orn. I. 331. III. 272.
Common Cuckoo. Cuculus canorus. Selb. Illustr. I. 397.
Cuculus canorus. Common Cuckoo. Jen. Brit. Vert. An. 154.

In both sexes the upper parts bluish-grey, the fore part and sides of the neck ash-grey, the breast and sides of the body bluish-white, transversely barred with brownish-black, the quills dusky-brown, tinged externally with grey, their inner webs barred with white; the tail-feathers greyish-black, spotted along the shafts and on the inner web, and tipped with white. Young with the upper parts transversely barred with light red and clove-brown, the lower with brownish-white and dusky.

Male.—This general favourite, whose cry is familiar to all, either in the original, or through the medium of imitations, is one of the most elegantly formed and agreeably coloured of our native birds. The singular circumstances connected with its mode of propagation have moreover rendered it an object of peculiar

interest. In shape it bears some resemblance to the Kestrel, and in colour to the Sparrow-hawk. The body is rather small in proportion to the plumage, the head ovate, and of ordinary size. The bill is shorter than the head, at the base rather broader than high, compressed toward the end, and somewhat arched. The upper mandible has its dorsal outline arcuato-declinate, the ridge rather narrow, the sides sloping and becoming gradually more convex towards the end, the tip a little decurved, narrow, sharp, with slight indications of notches, the edges sharp and a little overlapping. The lower mandible has the angle short and wide, the dorsal outline concave, the ridge narrow, the sides sloping outwards, flat at the base, convex towards the end, the edges sharp, the tip narrow. The gape-line is considerably arched, and the mouth wide.

The upper mandible is internally flat, with a slightly prominent central line; the whole roof of the mouth is also flat, as in Goatsuckers and Swifts. The posterior aperture of the nares linear and papillate. The tongue, Pl. XV, Fig. 1, *a*, rather short, slender, thin, oblong, slightly concave above, emarginate at the base, with minute papillæ, and a large pointed one at each angle, the tip acute, but varying considerably, as will be afterwards explained. The aperture of the glottis has numerous flat, pointed papillæ, and two large acuminate ones behind. The mouth measures ten and a half twelfths of an inch across. The œsophagus, *b*, *c*, is five and a half inches long, and tapers from a diameter of ten twelfths to that of five twelfths, so as to be somewhat funnel shaped in its extra-thoracic part. Its walls are extremely thin, the inner coat longitudinally plicate when not distended, and plentifully supplied with mucus. The proventriculus, *d*, is elliptical, about an inch long, its greatest diameter seven twelfths; its glandules large, generally half a twelfth in diameter, the upper oblong and inclined downwards, as is seen in Fig. 2, *a*, *b*, and *c*, the lowest ovate and directed upwards, those about two-thirds down roundish and direct, all simple or unlobed. The stomach, Fig. 1, *e*, *f*, is large, round, an inch and three twelfths long, an inch and two twelfths broad, nine twelfths in thickness; its muscular coat is very thin, and composed of distinct flattened fasciculi,

so that there is no division into lateral muscles; its middle coat very thin; the inner or cuticular, Fig. 2, *c*, *d*, slightly rugous, frequently stuck all over with hairs, as in Fig. 3, but sometimes quite free of them, varying from a twelfth to half a twelfth of an inch in thickness, and exceeding the other coats. The pylorus is an oblong slit, without knobs or valves, but closed by a thick-edged fold of the inner coat. The intestine, Fig. 1, *c*, *h*, *i*, *j*, *k*, which is seventeen inches long, is rather wide, its diameter varying from four and a half twelfths to two and a half, enlarging towards the cœca to three-eighths; the rectum, Fig. 4, *a*, *b*, two and a half inches long, enlarging to a diameter of nine-twelfths. The cœca, *c*, *d*, are about an inch and a half long, but very frequently unequal in length, cylindrical, about two-twelfths in diameter, but contracted at the base. The walls of the intestine are thin and translucent; the duodenal fold, Fig. 1, *c*, *h*, *i*, villous internally, the lower part, *i*, *h*, *j*, with shallow scrobiculi. The intestine runs at first along the right edge of the stomach, as usual, returns and ascends behind the right lobe of the liver, receives the biliary ducts, descends on the right side, forming several short convolutions, then a second fold, which is contorted, ascends on the left side as far as the middle of the proventriculus, and then passes along the middle of the sacrum.

The nostrils are elliptical, a twelfth and a half long, with a prominent margin, and placed in the lower and fore part of the short and broad nasal membrane, which is anteriorly bare. The eyes are of moderate size, their aperture three-twelfths. That of the ear elliptical, and four-twelfths. The feet are very short; the tarsus feathered halfway down, anteriorly with four large scutella, posteriorly rather sharp, with eight small scutella. The first toe is very small, with six scutella; the second much longer, with eight; the third longest, with eleven; the fourth considerably shorter, reversed, with eleven scutella. The claws are rather small, arched, much compressed, laterally grooved, rather blunt.

The plumage is soft and blended; the feathers generally ovate, with a short plumule; those on the rump elongated and rather strong, the upper and lower tail-coverts stronger than usual.

The wings are long, straight, and pointed, with twenty quills; the primaries tapering and rounded; the first about two-thirds of the length of the second, the third longest, the fourth next, the second a little longer than the fifth, the rest graduated; the secondaries rather short, broad, the outer abrupt, the rest obliquely rounded, with a very short acumen. The tail is long, straight, broad, graduated, of twelve feathers, the outer an inch and a quarter shorter than the next, whch is eight twelfths of an inch shorter than the longest.

Length to end of tail 14 inches; extent of wings 23; bill along the ridge $\frac{10}{12}$, along the edge of lower mandible $1\frac{1}{8}$; wing from flexure $8\frac{8}{12}$; tail $6\frac{4}{12}$; tarsus $\frac{7}{8}$; first toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{5}{12}$; second toe $\frac{6\frac{1}{2}}{12}$, its claw $\frac{5}{12}$; third toe $\frac{10\frac{1}{2}}{12}$, its claw $\frac{4\frac{1}{2}}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{3\frac{1}{2}}{12}$.

The bill is greyish-black, the basal margins and part of the lower mandible orange. The bare margins of the eyelids are gamboge yellow; the iris orange. The tarsus and toes are orange, the claws ochre yellow. The general colour of the upper parts is bluish-grey, lighter on the head, tinged with green on the back and wings, more blue on the rump. The quills are dusky brown, their outer webs tinged with grey; the inner webs of the primaries marked with oblong transverse white bands. The tail is greyish-black, glossed with green, the feathers tipped, and along the shafts and inner edges spotted with white. The throat and fore part of the neck are light ash-grey; the breast and sides white, transversely barred with brownish-black, each feather having three bars; the lower tail-coverts yellowish-white, and similarly barred; the abdomen with faint bars. The concealed part of the plumage is light ash-grey.

Female.—There is no such difference between the male and the female as to colour or size as could enable one to decide the sex of an individual without opening it. The brown tints and reddish markings alleged by Montagu and others to be peculiar to the female, occur in both sexes only in their earlier years.

Length to end of tail $13\frac{1}{2}$ inches; extent of wings 23; wing

from flexure $8\frac{8}{12}$; tail $6\frac{1}{4}$; bill along the ridge $\frac{10}{12}$; tarsus $\frac{10\frac{1}{2}}{12}$; middle toe and claw $1\frac{1}{4}$.

Variations.—In adult individuals the variations of the exterior are slight, some being more glossed with green on the back, and some tinged with brown on the wings and fore-neck. Old birds I have found invariably as above described. The variations in size, and in the proportions of the parts, are not important; nor are those in the length and diameter of the digestive organs considerable. The following are some of the measurements of five individuals.

	MALE.	M.	M.	F.	F.
Length.....	14	—	—	$13\frac{1}{2}$	14
Extent of wings.	23	—	—	23	22
Œsophagus.....	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{4}$	$5\frac{1}{2}$	$5\frac{1}{4}$
Proventriculus...	1	$\frac{10}{12}$	$\frac{9}{12}$	1	$\frac{10}{12}$
Stomach.....	$1\frac{3}{8}$	$1\frac{2}{12}$	$1\frac{2}{12}$	$1\frac{2}{12}$	$1\frac{2}{12}$
Intestine.....	$18\frac{1}{2}$	19	17	18	18
Cœca.....	$1\frac{1}{2}$, $1\frac{4}{12}$	2, $1\frac{5}{12}$	$1\frac{10\frac{1}{2}}{12}$, $1\frac{1}{2}$	2, $1\frac{10}{12}$	—

Changes of Plumage.—I have found individuals in fresh and perfect plumage immediately after their arrival, so that they must have moulted in their winter quarters. Thus, one sent to me by Captain Graham in May 1834 had its feathers quite new. In the wings were three secondary quills barred with dusky and light red, which were ragged from wearing, shewing that it was in its second year. In individuals obtained at a later period, I have not observed much difference in the plumage, and therefore I believe that the moult does not take place in this country.

Additional Observations.—The tongue varies considerably with respect to the form of its tip, as represented by Pl. XVI, Fig. 5, *a b c d*, taken from four specimens which I had kept in spirits for dissection. One has the tongue acutely pointed; the second has it narrow, with a slight slit; the third shortened, emarginate, the tips blunted and bristly on the edges; the

fourth rounded without slit, but with the edges and tip bristly. These differences appear to be produced by use, the first or pointed form being the normal. Similar changes are exhibited in the bill, claws, and feathers of many birds.

The œsophagus and stomach, in fact the digestive organs in general, are very similar to those of the Owls. It is a very remarkable circumstance that when the bird arrives at first, its food consisting of coleopterous and other insects, the cuticular lining of its stomach is smooth; whereas some time after, when the bird lives chiefly on hairy caterpillars, it is often completely covered with their hairs, which are thrust in and arranged in a circular manner, so as exactly to resemble the pile of some quadrupeds. This disposition of the hairs shews that the action of the stomach causes the mass of food contained in it to move in a rotatory manner. It also shews that the epithelium, although very soft, is destitute of blood-vessels and nerves, otherwise inflammation would be induced by so many punctures. Coccyzus Americanus, a species of a nearly allied genus, which I have dissected, presents the same circumstance. "In examining this bird by dissection," says Wilson, "the inner membrane of the gizzard, which in so many other species is so hard and muscular (horny), in this is extremely lax and soft, capable of great distension; and, what is remarkable, is covered with a growth of fine down, or hair, of a light fawn colour. It is difficult," he continues, "to ascertain the particular purpose which Nature intends by this excrescence; perhaps it may serve to shield the tender parts from the irritating effects produced by the hairs of certain caterpillars, some of which are said to be almost equal to the sting of a nettle." This down, of course, is nothing else than hairs of caterpillars, and it is amusing to observe the idle ingenuity perpetually displayed in assigning reasons for facts and phenomena of which people have no adequate knowledge. On this subject the author of the article Cuckoo in Partington's Cyclopædia remarks that "the same has been said, first probably by some compiler who had read Wilson's article, and who thought he might safely enough infer it from analogy, of the stomach of the European Cuckoo, but the writer of this has dissected several, and never observed anything of the kind." Then, let him dissect several more, and learn the truth.

In examining a female I found not less than twelve eggs that were in the progress of development. They were disposed in separate clusters, one of which contained three, another six, and the third three. One of them had a diameter of nearly five twelfths of an inch, and therefore was ready to pass into the oviduct, which was of course highly developed and curiously contorted; the inner surface of its upper part longitudinally rugous, the lower transversely and spirally. This observation is of course decisive as to the Cuckoo's laying more than one egg in the season, or at a time. Fig. 6 represents the parts in question: *a*, the eggs; *b*, the oviduct, entering into the cloaca, *c*. Fig. 7 shews the internal surface of part of the oviduct cut open. From the size of the oviduct it would appear that one or more eggs had already been laid, and it is probable that the bird continues to lay at intervals from the middle of May to near the period of its departure; for Montagu states that he found a fully developed egg in one shot on the 26th of June.

The stomach is so large that when distended it almost entirely fills the anterior or lower part of the abdomen, with the walls of which it is in contact; and this circumstance has been adduced as furnishing a reason for the parasitic habits of the species, it being imagined to prevent incubation. But in many other birds, the Owls and Goatsuckers, for example, the stomach is similarly situated, and equally large. Indeed, the connection of the two facts is merely one of the many hundreds of false reasonings with which natural history is encumbered. The cœca, as I have already mentioned, vary in size, and are generally unequal, the left being smaller. Fig. 8 represents those of another individual.

Habits.—The Cuckoo arrives in the south of England about the 20th of April, in the south of Scotland towards the end of that month, and in the northernmost parts of Britain soon after the beginning of May. The periods of arrival, however, vary considerably according to the character of the season, and as the birds do not always announce their return by emitting their well-known cry, they may sometimes be met with at a time when their presence is not suspected. There seems to be hardly

any part of the country which they do not visit; for while some remain in the southern counties, others settle in the remotest islands of the north, and although they are met with in the most cultivated districts, they also frequent the valleys of the wildest of our hilly and mountainous tracts. Perhaps the most favourite resorts of the species are parks and plantations bordered with fields and pasture-grounds, or the woods and thickets of the upland glens; but on the rocky hills of the most treeless regions, and the bleak moors or ferny braes of the interior, it is found often in great numbers, although never in flocks, for if gregarious during its migrations, as some suppose, it manifests no social disposition during its residence. Whether it be more numerous in the south than in the north I cannot affirm, for while it is stated "that they abound in the Malvern Hills, making the whole circuit of them resound with their note," they are as plentiful in the wooded valleys of the counties of Ross and Inverness.

In the maritime Highlands and Hebrides, about the time of the arrival of the Wheatear, every one is on the look-out for the Cuckoo. Both birds are great favourites with the Celts, the latter more especially, but both may be the harbingers of evil as well as of good; for should the Wheatear be first seen on a stone, or the Cuckoo first heard by one who has not broken his fast, some misfortune may be expected. Indeed, besides the danger, it is considered a reproach to one to have heard the Cuckoo while hungry, and of such a one it continues to be said that the bird has muted on him, "chac a chuaig air." But should the Wheatear be seen on a turf or on the grass, or should the Cuckoo be heard when one has prepared himself by replenishing his stomach, all will go well. Such at least was the popular creed ~~twenty~~ thirty or more years ago, when I began in earnest to look after birds. The Highlanders have perhaps become wiser; at least they are now poorer, and poverty gives rise to reflection. The Saxons of the south, it would appear, were wont to think differently of the Cuckoo, and to listen with no friendly feeling to its cry. But the lover of nature, whether Saxon or Celt, gladly hails the bird of summer.

"Cuckoo! Cuckoo! O! welcome, welcome notes!
Fields, woods, and waves rejoice
In that recover'd voice,
As on the wind its fluty music floats.
At that elixir strain,
My youth resumes its reign,
And life's first spring comes blossoming again."

Early in the sunny mornings of May, and towards the close of day, he who wanders along the wooded valleys will be sure to hear the ever-pleasing cry of the Cuckoo, unvaried though it be, as the bird, perched on a rock, or lichen-clad block, or balancing itself on the branch of some tall tree, cooes aloud to its mate. Let us pause and listen: the bird is not far distant, and we may describe its song, such as it is. You hear nothing but the same *hu-hu*, or if you please so to syllable it *coo-coo*, repeated at short intervals; but if you attend better you will find that these two loud and mellow notes are preceded by a kind of churring or chuckling sound, which, if you creep up unseen, you will hear to consist of a low and guttural inflection of the voice, during which the throat seems distended. But the Cuckoo, ever vigilant and shy, has observed you, and flies off, followed by two small birds, which, by their mode of flying and incessant cheeping notes, you know to be Meadow Pipits. They keep pace with it, and when it alights on the grassy bank, they alight too, and take their stand in its vicinity. You have heard that Cuckoos lay their egg in the nest of a Pipit or other small bird, and you at first suppose these to be its foster-parents. This, however, is not a young Cuckoo, but an old grey male just arrived from the sunny south. Then what have the Pipits to do with it? I cannot tell, for although I have rarely in the hilly parts of the country seen a Cuckoo unattended by one or two of them, I have not observed that it was fed by them, or that they molested it otherwise than by hovering about it. They attend upon it, fly after it, stand beside it, and seem to be concerned about it, to be distrustful of it, to watch its motions, and to indicate their dislike to it by their continued cheepings. It seems to me that they take it for a hawk. But the Cuckoos are not always followed by Pipits, for often you may see them gliding among the trees without any attend-

ants; yet so generally are these birds seen together on the open moors and pastures, that "the Gowk and the Titling" is a common saying in Scotland. But it is sadly misapplied to a person following and fawning upon his patron, or to two individuals of disproportionate size whose friendship keeps them continually together. The name which the Scots give to the Cuckoo they also apply to a foolish person, no doubt on account of his continued and silly babble. Later in the season, you may see a young Cuckoo followed and fed by Pipits; but its colours are very different from those of the old bird. Sometimes also you may find it surrounded by Swallows and other small birds, which are intent on molesting it to the utmost of their power.

The flight of the Cuckoo is swift, gliding, even, rapid on occasion, generally sedate, usually at no great height. In the hilly parts it may be seen skimming over the ground, alighting on a stone or crag, balancing itself, throwing up its tail, depressing its wings, and then perhaps emitting its notes. In woody districts it glides among the trees, perches on their boughs, and makes occasional excursions into the thickets around. On the ground I have seldom seen it unless when cooing, and there it can scarcely walk with more ease than a Swallow; but on trees it alights with facility, clings to the twigs with firmness, glides among the foliage, and by the aid of its tenacious grasp and ample tail, throws itself into various and always graceful postures, as it searches for its prey. Its food consists of coleopterous, lepidopterous, and dipterous insects, in procuring which it must visit a variety of places, and very much of hairy caterpillars, which it picks from among the grass and heath, where, however, it cannot search by walking, like the plover or curlew, as its feet are too short, and its toes misplaced for such a purpose. Yet it can hobble round a bush to pick the worms from it, as well as cling to its twigs. "The great quantity devoured by the Cuckoos in a short space of time," says Mr Weir, "is truly astonishing, and would scarcely be believed, except by those who have been witnesses to the fact. They have for several years been the means of preventing the gooseberry bushes in my garden from being destroyed."

The substances which I have usually found in the stomach of the Cuckoo were insects of various kinds, hairy caterpillars, and smooth larvæ; but I have also found in it vegetable matter. Thus, it is recorded in one of my note-books respecting a male examined in June 1836, that the cuticular lining of the stomach is "smooth, soft, in this instance without hairs, it being filled with vegetable fibres and blades of grasses." I have never met with a fragment of the elytra, the articulation of a limb, or any other hard part of an insect in the intestines, the contents of which are a uniform pulpy and impalpable mass of a light red colour. Of course, the remains of insects in the stomach must be thrown up in pellets, as in Hawks and Owls. Hairs and other matters I have several times found in so great a mass as to distend the stomach nearly to its greatest capacity. It has been conjectured that the Cuckoo occasionally feeds on eggs, especially those of the small birds in the nests of which it deposits its own; but I am not aware of its having been caught in the act. It has also been accused of eating young birds, but no one has found bones or feathers in its stomach.

The Cuckoo is a very shy bird, so that one cannot follow its motions; but facts in its history and organization lead to inferences, which may be correct, if carefully educed. Thus, it may be heard cooing at most hours from sunset to dawn, and I have listened to its notes at midnight, when they have a very singular effect. This circumstance has been noticed by others as well as myself. Thus, in the third volume of the Magazine of Natural History, p. 466, Mr White makes the following statement:— "During the summer of 1830, the days were wet and chilly, and the nights clear and calm; so that the night was, in fact, more pleasant than the day: so much so, that I frequently walked out after supper, and as frequently heard both the Cuckoo and the Nightingale from ten till eleven o'clock; but on two succeeding evenings, the 4th and 5th of June, the moon being about full, and shining with 'unclouded majesty,' I heard, about 'the witching hour of night,' both the Cuckoo and the Nightingale; and on the 9th, as I was returning from a party of friends, with the fair partner of my pleasures and pursuits, a little after midnight, we were highly gratified in

hearing a trio, with all the native melody of the grove, performed by the Cuckoo, the Nightingale, and the Sedge-Warbler."

It is frequently seen abroad at early dawn, and sometimes very late in the evening; while at mid-day you seldom meet with it unless in woods, or perched on a stone in the moors. Is it not then somewhat nocturnal? Then, its mouth is wide, bedewed with a viscid fluid, and the flat form of its palate reminds you of that of the Goatsuckers and Swallows, as well as of the Owls. Its digestive organs are like those of the former and latter of these birds, and its food is similar, bating mice and birds. It is therefore probable that it takes a part of its prey on wing, more especially in the twilight.

Now, if we seek for analogies and affinities, we may feel disposed to think that Cuckoos are "in their own circle analogous" to what?—according to Mr Swainson, to the Tenuirostres among the Insessores, and to the Rasores or Gallinaceous birds in the series of orders. You will naturally think that their nearest allies are Goatsuckers and Owls; but if you will have all things by fives or threes you must not scruple to prefer remote to direct affinities when it suits your purpose to do so.

The Grey Cuckoo is not necessarily and therefore not essentially a bird of the woods, like a Woodpecker or a Parrot; nor is it therefore a climber. Its haunts are more especially the open pastures, and although it perches on a tree or a stone, and has feet like a Woodpecker in this one respect that the outer toe is turned backwards, it is not therefore any more a climber than a Thrush or a Swallow, certainly less so than a Siskin or a Redpoll Linnet. But many birds of similar form are described by authors acquainted with their habits as sylvicolous and as climbing, not indeed in the manner of Woodpeckers, but somewhat like Parrots, that is by grasping the twigs or branches, and young Cuckoos kept in captivity have been observed occasionally to employ the same action. The feet of the Cuckoo however do not present the very strong curved claws peculiar to the truly climbing birds, or rather to those which are capable of clinging to a perpendicular surface. Some species of this family have the claws elongated and little curved, and having also tarsi of considerable length, are thus enabled to walk

with ease over the grass or other herbage. As to our bird, it no doubt can cling to the branches with firmness, but it is no more a climber in any sense than the Jay or the Blackbird, which, although they often resort to woods, also frequent the open grounds. In fact, the order Scansores of authors is a most heterogenous association. Greater differences than there are between the feet of a Cuckoo and those of a Linnet, occur in even the most possibly natural family, namely in the Chelidones; and if a certain arrangement of the toes, without regard to their strength and the form of the claws, were so important as some ornithologists would have us to believe, the Swifts and Swallows ~~ought to stand~~ in different orders ~~the common Gull and the Kittiwake in different genera~~.

The most remarkable trait in the character of the Cuckoo is its confiding the charge of hatching its eggs, and rearing its young, to some other bird, always much smaller than itself. The species on which it thus imposes its progeny is generally the Meadow Pipit, Anthus pratensis. In Scotland I have never heard of its laying in the nest of any other bird, but in England its egg has been found in those of various species:—the Hedge Chanter, ~~White~~ Wagtail, Sky Lark, Nightingale, Garden Warbler, and others. The egg is small in proportion to the size of the bird, being generally not much larger than that of its foster parent, its average length from ten to eleven twelfths of an inch, its greatest diameter from eight to nine twelfths, its colour white, greyish-white, or reddish-white, speckled with ash-grey or greyish-brown. Various conjectures have been hazarded as to the cause of the disproportionately small size of the eggs. If we say that as the Cuckoo is physically constrained to deposit its egg in the nest of some small bird of the insectivorous kind, its egg must be nearly of the size of those of its dupe, we may state a truth, but we afford no explanation of the phenomenon. Why should it be so constrained? why does it not form a nest, hatch its eggs, and rear its young? Because, as some say, it leaves its summer residence early in July, and as it remains only two months there, it could not leave its young in a sufficiently advanced state to shift for themselves. But why should it hurry away so fast?

has it not abundance of food? does it not go away at the very time when insects and larvæ are most abundant? If it dreads the cold of early autumn, is not that of April or even May much greater? and if its tender young find enough of heat until September, how is it so much more sensitive? It has been alleged, conjecturally I believe, that the ovary is less plentifully supplied with blood than that of other birds of similar size, and therefore the eggs are not developed. I can see no difference in this respect between the Cuckoo and the Magpie or Jay; but if there were, although the smallness of the eggs might be accounted for in so far, how is it necessary that they should be small? In short, all that we know about the matter is just this: The Cuckoo arrives in the end of spring, and departs in July; it forms no nest, but deposits its eggs singly in the nests of various small birds, which hatch them, and rear the young. The latter not being well fledged until September, remain two months behind their parents.

The eggs of birds are not proportioned to their size. The single egg of the Auks is enormously large; the three eggs of the Cormorant very small; the numerous eggs of the Geese moderate; those of the Wren very large. It is as incomprehensible that a Guillemot should lay only one egg of extravagant size, as that a Cuckoo should lay twenty of the opposite kind. Were we to suppose that eggs few in number are proportionally large, observation would convince us that this is not always and regularly the case. The Curlew lays four eggs; and the Hooded Crow five; but although these birds are nearly equal in size, one of the eggs of the former weighs more than all those of the latter. The Rock Pigeon and Jackdaw are about the same size; so are their eggs; but the former lays only two, and the latter five. It must not therefore be said that the Cuckoo's eggs are very small, because they are very numerous.

According to the statement of M. Temminck, the phenomena in question have been explained as follows:—"M. Schlegel, one of the assistant naturalists of the museum, has furnished, in an essay crowned by the Natural History Society of Harlem, details of the greatest interest as to the very probable causes which induce the Grey Cuckoo, as well as all the species which lay

in the nests of small insectivorous birds, not to hatch and rear its young; and he considers as a principal cause of this peculiarity the choice of their ordinary food. The nourishment of the Cuckoo consists almost entirely of very hairy caterpillars, as Bombyx caja, &c., the great bulk of which overloads and singularly inflates the stomach, affording at the same time very little nourishment. From this nutrition results a great development of the whole organ, and an unceasingly returning hunger. The development of the stomach appears to influence that of the eggs in the ovary, which are known to be very small, and which the bird lays at intervals of from six to eight days. The sum of the author's observations is, that the Cuckoo cannot attend to incubation, as it is incessantly occupied in pursuing its prey; that it cannot, by means of the food which it prefers, satisfy the wants of from four to six voracious young ones, which grow with an astonishing rapidity. The position and great size of the stomach would hinder digestion during the act of incubation; should incubation take place, the constantly recurring need of food would be injurious to the necessary development of the young in the egg; to lay from four to six eggs, the Cuckoo would take so many weeks, and the first egg would be addled before the last were laid. Lastly, the young could not be developed in time to perform their migration, for want of the food necessary for themselves and their parents. If such is actually the cause of this phenomenon in some species of Cuckoos, which I am inclined to believe it to be, it would follow that certain species, which are not subjected to this same mode of nourishment, may nestle and attend to incubation exactly like other birds."

Now, I have found by dissection that the two common Cuckoos of North America have the stomach capable of great distension, and covered internally with hair, so as to be precisely similar to that of the Grey Cuckoo. What then comes of all the above reasoning? Moreover, the Barn Owl has a stomach when collapsed an inch and a quarter long, and when distended three inches, and it occupies precisely the same place as in the Cuckoo, and is larger in proportion to the size of the bird. Yet the Owl incubates, and although it has but a short time to look for

food, and therefore fills its stomach as full as it can, and swallows hair, down, and feathers, hatches its eggs and digests its food quite efficiently.

It appears from the observations of various persons, that the Cuckoo, having found a nest, watches for the absence of its owner, then deposits its egg, and flies off; that in general the nest in which it places its egg contains none or few eggs; that the owners of the nest sometimes eject the intruded egg; and that in a few instances two Cuckoos' eggs have been found in the same nest. It is also stated that the Cuckoo, on depositing its egg in a nest already containing eggs, sometimes carries off one or more of them; but frequently nests have been found containing the ordinary number of eggs along with that of the Cuckoo. Pipits and other small birds finding a Cuckoo at or near their nest manifest alarm, anxiety, and hatred towards it, just as they would toward a Jay or other suspected bird.

It was known to the ancients that this bird leaves its egg to be hatched by another, but they mingled the real with the fabulous, believing that the young devoured not only those of its foster-parents, but finally the latter themselves. The manner in which the young Cuckoo's fellow-lodgers disappear from the nest is perhaps as marvellous as anything else in the history of this strange bird. A pair of Pipits, Wagtails, or Hedge Chanters, would find it a sufficient task to provide their own young with food, and probably would be unable to satisfy in addition the incessant cravings of the young Cuckoo, which grows very rapidly, and as it soon completely fills the nest, would crush to death or suffocate its feebler fellow-lodgers. The young Cuckoo, as if in order to obtain sufficient nourishment, and prevent the protracted misery of its foster-brethren, ejects them from the nest, and their parents, unable to replace them, or failing to recognise them, leave them to perish. The exclusive occupation of the nest by the young Cuckoo was first satisfactorily accounted for by Dr Jenner, the discoverer of vaccination, who, in the Philosophical Transactions for 1788, states that having found a nest of the hedge-sparrow containing a cuckoo's egg and three of the hedge sparrow's, but the day following a young cuckoo and a young hedge-sparrow, two of

the eggs having disappeared, he "saw the young cuckoo, though so lately hatched, in the act of turning out the young hedge-sparrow. The little animal, with the assistance of its rump and wings, contrived to get the bird upon its back, and making a lodgement for its burden by elevating its elbows, clambered backwards with it up the side of the nest till it reached the top, where, resting for a moment, it threw off its load with a jerk, and quite disengaged it from the nest. It remained in this situation for a short time, feeling about with the extremities of its wings, as if to be convinced whether the business was properly executed, and then dropped into the nest again. With these, the extremities of its wings," he continues, "I have often seen it examine, as it were, the egg and nestling before it began its operations; and the nice sensibilities which these parts seem to possess, seemed sufficiently to compensate the want of sight, which as yet it was destitute of. I afterwards put in an egg, and this, by a similar process, was conveyed to the edge of the nest and thrown out. These experiments I have since repeated several times, in different nests, and have always found the young cuckoo disposed to act in the same manner." He then states that its shape is well adapted for this purpose, as its back is very broad, with a depression in the middle, which is not filled up until it is about twelve days old. When two cuckoos' eggs happen to be deposited in the same nest, a severe contest takes place between the newly-fledged young, and continues until the weaker is ejected.

These observations have been verified by Montagu, who, in the Introduction to his Ornithological Dictionary, makes the following statement. "I first saw it (the young Cuckoo) when a few days old in the Hedge-Sparrow's nest in a garden close to a cottage, the owner of which assured me the Hedge-Sparrow had four eggs when the Cuckoo dropped a fifth; that on the morning the young Cuckoo was hatched, two young Hedge-Sparrows were also excluded, and that on his return from work in the evening, nothing was left in the nest but the Cuckoo. At five or six days old I took it to my house, when I frequently saw it throw out the young Swallow (which was put in for the purpose of experiment) for four or five days after. This singular

action was performed by insinuating itself under the swallow, and with its rump forcing it out of the nest with a sort of jerk. Sometimes, indeed, it failed after much struggle, by reason of the strength of the Swallow, which was nearly full-feathered, but after a small respite from the seeming fatigue, it renewed its efforts, and seemed continually restless till it succeeded. At the end of the fifth day this disposition ceased, and it suffered the Swallow to remain in the nest unmolested."

Similar observations made by Mr Blackwall, are recorded in the Manchester Memoirs, 2d series, Vol. IV. "On the 30th of June," he relates, "I took a young Cuckoo that was hatched in a Titlark's nest on the 28th, seven days after the old birds had quitted the neighbourhood; and this nestling, while in my possession, turned both young birds and eggs out of its nest, in which I had placed them for the purpose, and gave me an opportunity of contemplating at leisure the whole process of this astonishing proceeding, so minutely and accurately described by Dr Jenner. I observed that this bird, though so young, threw itself backwards with considerable force when any thing touched it unexpectedly."

Beyond this, there is nothing marvellous in the history of the young bird, which, carefully fed by its foster-parents, who no doubt believe it to be their own progeny, grows apace. It appears that very many species of birds having hatched the eggs of other birds, consider the produce to be really their own; and that many also without having incubated will adopt a helpless youngling and feed it. It is not more wonderful that the Pipits or Wagtails should harbour no suspicion of the alien character of the great bird which fills their nest, than that a hen should continue to perform a motherly part toward the ducklings which manifest the difference of their nature by gladly betaking themselves to the water of which she has a salutary dread. While the young Cuckoo remains in the nest, it is plentifully supplied with food by its friends, who, ignorant of the destruction of their own young, and having their parental feeling excited by its continued demands, cheerfully labour in its behalf. When it can fly, and has left the nest, they continue to provide for and protect it to the best of their power, and this

conduct of theirs seems the more strange that it contrasts with that of other little birds, even of the same species, but especially Swallows, which fly after and endeavour to molest it.

Mr Durham Weir has sent me the following notes having reference to this subject: "'There is one point,' says a modern naturalist, 'in the anomalous history of the Cuckoo, which has not been so well authenticated as the rest, and that is, whether the male falls into the same dupery as the female, and aids in rearing the Cuckoo?' That he sometimes assists the female, in giving food to her adopted young one, I can affirm, as several instances have occurred to my knowledge. In June 1835, the following one came under my notice. Upon the top of Monyfoot Hill, Linlithgowshire, I knew a Titlark's nest built under a bush of heath. It contained five eggs, one of which had been deposited in it by a Cuckoo. The rightful owners, a few days after they had been hatched, were lying dead on the ground, having been turned out by the intruder, who became the sole occupant of the nest. One afternoon, I observed the male and female Titlarks repeatedly flying in with worms and flies in their bills, and feeding the nestling with the greatest care and anxiety. When I went near the nest, they hovered about me, uttering their cry of alarm. They always flew off together, and returned with the food which they had obtained. When about three weeks old, this young Cuckoo assumed an air of boldness, and when I handled it, it ruffled its feathers, and put itself in an attitude of defence. I took it home with me, and kept it between four and five months. It soon became very tame and even familiar. It was at times fierce and pugnacious, and when teased, it came out of its cage and fought with my fingers, sparring and buffeting with its wings, like a game-cock. Its voracity was insatiable. The Cuckoo for some weeks after it is fully fledged, is fed by its foster parents. When they see any one approaching their charge, they give it instant warning, on which it flies off to some distance. These young birds are so very shy, that although I have pursued them for hours, I have seldom been able to get within shot of them."

In a subsequent communication, dated the 16th July 1838, he presents the following very interesting account of a young

Cuckoo, which is fairly worth all the notions of the closet naturalists from Pliny to the present day.

" In this part of the country, the nest of the Titlark is the one almost invariably selected by the Cuckoos for depositing their eggs. Indeed, I have never seen them in any other. In Balgornie Moor, situate in the extremity of the parish of Bathgate, on Saturday the 19th of May 1838, a pair of Titlarks finished their nest. The female laid an egg upon Sunday, Monday, and Tuesday. During one of these days, a Cuckoo took the opportunity of dropping her egg amongst those of the Titlark. How she succeeded in doing this, I know not, as the nest was built upon the side of a deep perpendicular ditch, the top of which was thickly covered over with strong heath in the shape of a dome, and the entrance into it was very narrow.

" Nearly the same period of incubation seems to be required for hatching both kinds of eggs. Upon Wednesday morning the 23d, the female Titlark began to sit upon the eggs, and upon that day fortnight, the 6th of June, they were all hatched. I saw them a short time after this had taken place. The young Cuckoo appeared to be about one-third larger than the Titlarks, and of a dark colour. It was constantly gaping for food. Upon its back, from the shoulders downwards, there was a particular depression, which I do not recollect of having seen in any other young bird. On the afternoon of the 10th, two of the Titlarks were found lying dead at the bottom of the ditch. The other one had disappeared.

" On Wednesday afternoon the 13th, the feathers of this young bird had a strong resemblance to the prickles of the hedge-hog, and it had grown so fast that it nearly filled the whole nest. When any thing touched it unexpectedly, as has been remarked by Mr Blackwall, it threw itself back with considerable force. It was bold and fierce. When I put my finger near its bill, it ruffled its feathers, stood upon its legs, struck at it with its wings, and even attempted to bite. For several hours I watched the motions of the foster parents in order to ascertain whether they were still kind to the charge committed to their trust, and they continued to pay it the same unwearied attention. During the space of an hour they fed it generally ten or twelve times. The

female occasionally remained in the nest several minutes. Both were exceedingly shy and cunning. So long as I was within sight of them they would not feed the Cuckoo. I was therefore obliged to conceal myself in a plantation with the branches of the Scotch fir. When they brought food they always alighted at the distance of about fifteen or twenty yards from their nest, and stole softly amongst the grass at the bottom of the ditch, and now and then stood still and looked around them with a jealous glance to see if their motions were watched. So artfully was their retreat concealed, that no one to whom it was not pointed out, would have had much chance of discovering it. As it was at a distance from my residence, I found it inconvenient to watch the habits of this Cuckoo so frequently as I wished. I therefore put it into the nest of a Titlark in my immediate neighbourhood, in which were five young ones about six days old, three of which I allowed to remain. I went next day in the expectation of seeing the young Cuckoo lying dead. To my astonishment, however, the female was covering it most carefully, with outstretched wings, from a very heavy shower of rain which was then falling. How she devoted her care to this surreptitiously introduced stranger, while her own young ones had in the meantime been expelled by the Cuckoo, and were at that moment lying lifeless within two inches of her nest, is a mystery in the economy of nature, which it would be extremely difficult to solve. I do not recollect having seen it mentioned in any book which I have perused, that the cry of the Cuckoo when young resembles that of the titlark. This perhaps was the reason why the foster parents were so suddenly reconciled to their newly adopted nestling. They fed it most assiduously. On the afternoon of Thursday the 21st, it pursued my fingers, when I teased it, nine or ten inches beyond the nest, sparring with its wings, and crying like a hawk. As has been noticed by Colonel Montagu, when about fourteen days old, the restless disposition of these birds appears to cease, for after that, this Cuckoo suffered young birds to remain unmolested in the nest.

"From a hut formed of heath, within sixteen feet of the same nest, on Saturday the 30th of June, I made the follow-

ing observations. The male Titlark had disappeared for two or three days, having been, in all probability, destroyed by a Sparrow Hawk, which had young ones in the neighbourhood. The female, notwithstanding the loss of her partner, continued to shew to the Cuckoo the same unremitting kindness. Before she went to feed it, she always alighted upon the top of a Scotch fir, where she remained for some minutes looking anxiously around. She then flew down upon the ground at the distance of several yards from the nest, making zig-zag windings, and occasionally standing still. She brought to it sometimes snails, at other times a mouthful of large worms, some of which were more than three inches in length. One might have almost been inclined to believe that she was aware of the nature of the intruder and the voracity of its disposition, for I have never seen any of them bring such quantities of meat when feeding their own young. At the regularity with which she supplied its wants, I was truly surprised. For nine successive hours, during which I had watched her, she gave it food exactly four times in each hour. I remained until nine o'clock. She however left off her parental duties at a quarter past eight o'clock. In the morning she attempted to satisfy its craving appetite more frequently, generally seven or eight times within the hour.

"I shall now give you a short account of the manner in which the egg that I lately sent you was discovered to have been deposited in the nest of the titlark. In its size, tint, and markings it was the same as the one out of which the Cuckoo was hatched, whose habits I have just now described. Two sons of Mr David Tripeny, farmer in Coxmuir, asserted to me, that upon Sunday forenoon the 24th of June 1838, when they were sitting in a plantation tending their cattle, they saw a Cuckoo alight at no great distance from them, upon a hillock of moss. It picked up an egg with its bill, and after having looked round about as if to ascertain whether there was any one in sight, it hopped down with it amongst the heath. The lads immediately ran to the place into which they had observed it descend, and when at the distance of about six feet, they saw it rise from the side of a titlark's nest into which it had introduced its head.

In the nest, which was arched over with strong heath, and had a narrow entrance from the side, there was a newly dropped Cuckoo's egg along with one of the titlark's own. As I have no reason to doubt the accuracy of this observation, it confirms the statement of the celebrated Vaillant with respect to the Gilded Cuckoo, although the correctness of it is questioned by some, namely, that she puts her eggs into different kinds of nests by conveying them with her bill, and satisfactorily accounts for the way in which the Common Cuckoo, in some instances at least, is enabled to deposit her eggs.

"Two eggs of the Cuckoo are sometimes dropped in the same nest. One forenoon about the middle of June last, in the nest of a Titlark in my neighbourhood, built amongst heath, and which contained three eggs, there were two Cuckoo's eggs. In this nest it was observed that the Cuckoo's eggs were hatched fully a day sooner than those of the Titlark. On the third or fourth day after this, the young Titlarks were found lying dead on the ground, and the Cuckoos were in possession of the nest. They remained together in it nearly five days. On the morning of the sixth day, however, one of them had disappeared, and the other, which was the strongest, was brought up by its foster parents until it was able to provide for itself. It is very probable that the young birds which so soon disappear after they have been ejected from their nests, are carried away by mice, as these animals prowl about at night in pursuit of their food. I have heard the old Cuckoos crying during every hour of the day and night. They cease to emit their notes about the middle of July, and are seldom seen beyond that time. The young disappear about the middle or end of September."

It has been supposed that Cuckoos do not pair, but live in promiscuous concubinage, the fruits of which are consigned to the charge of other birds; and the supposition may prove correct, although as yet observations are wanting to confirm it. The old birds arrive in full plumage, and depart without having moulted. The young also take their departure previously to moulting, which, as in the old birds, takes place in winter. A young Cuckoo kept by the late Mr George Carfrae, being

fed on flesh, continued alive until the end of the following spring, when it had assumed the colours of the old bird, only that the fore-neck and breast were tinged with red, and the back with brown. Mr Richardson, engraver, in Preston Street, Edinburgh, obtained in the summer of 1838, a young Cuckoo unable to fly, which he fed chiefly with meat. It lived through the winter, having been kept near the fire, and is now, on the 20th of October 1839, in good health. It moulted in spring for the first time, and then assumed the plumage of the adult. It is very seldom however that one can be reared in captivity and brought through the winter. Another individual which I have seen had not moulted in November when it died, and one kept by Montagu from July till the 14th of December, underwent no change of plumage. I am therefore not inclined to credit the assertion of M. Temminck and others, that when the young depart in autumn, "they have all the upper parts of a uniform very dark olivaceous grey; some faint reddish bands on the nape; broader bars of the same colour on the secondary quills; the throat and breast transversely barred with reddish-grey and black; but all the rest of the plumage precisely as in adult individuals."

In speaking of the Song Thrush, I adduced, as related by Mr Weir, an instance of its feeding a young Cuckoo. Another of the same nature is related by the Bishop of Norwich, in his Familiar History of Birds. The case was this:—A young Cuckoo was taken from the nest of a Hedge-Sparrow, and a few days afterwards, a young Thrush, scarcely fledged, was put into the same cage. The latter could feed itself, but the Cuckoo, its companion, was obliged to be fed with a quill; in a short time, however, the Thrush took upon itself the task of feeding its fellow prisoner, and continued so to do with the utmost care, bestowing every possible attention, and manifesting the greatest anxiety to satisfy its continual cravings for food. "The following," he continues, "is a still more extraordinary instance, corroborating the above, and for the truth of which we can vouch in every particular. A young Thrush, just able to feed itself, had been placed in a cage; a short time afterwards a young Cuckoo, which could not feed itself, was

introduced into the same cage, a large wicker one, and for some time it was with much difficulty fed; at length however it was observed that the young Thrush was employed in feeding it, the Cuckoo opening its mouth and sitting on the upper perch, and making the Thrush hop down to fetch food up. One day when it was thus expecting its food in this way, the Thrush seeing a worm put into the cage could not resist the temptation of eating it, upon which the Cuckoo immediately descended from its perch, and attacking the Thrush, literally tore one of its eyes quite out, and then hopped back: the poor Thrush felt itself obliged to take up some food in the lacerated state it was in. The eye healed in course of time, and the Thrush continued its occupation as before, till the Cuckoo was full grown."

A case of a like nature, but referring to the Cow Bunting, a small bird whose mode of propagation is similar to that of the Grey Cuckoo, is related by Wilson, in his American Ornithology. Having taken from the nest of a Maryland Yellow-throat, a young male Cow Bunting, he "placed it in the same cage with a Red Bird, *Loxia cardinalis*, who at first, and for several minutes after, examined it closely, and seemingly with great curiosity. It soon became clamorous for food, and from that moment the Red Bird seemed to adopt it as his own, feeding it with all the assiduity and tenderness of the most affectionate nurse. When he found that the Grasshopper which he had brought it was too large for it to swallow, he took the insect from it, broke it in small portions, chewed them a little to soften them, and, with all the gentleness and delicacy imaginable, put them separately into its mouth. He often spent several minutes in looking at and examining it all over, and in picking off any particles of dirt that he observed on its plumage." But this assumption of the office of a nurse has been manifested by many birds of ~~the~~ various orders ~~Cantatores, Deglubitores, and Vagatores~~, with regard to helpless individuals, not only of their own but of other species; insomuch that it would seem to result from the excitement of the parental instinct effected by the solicitations of the destitute orphan.

Young.—The young Cuckoo when fledged may be described

as follows. The bill, which is much shorter and less curved than that of the adult, is dusky, with the sides of both mandibles yellowish; the iris brown, the feet and claws dull yellow, the latter a little dusky towards the end. The upper parts are transversely banded with light red and dark greyish-brown, most of the feathers being also tipped with reddish-white. The alula, primary quills and their coverts are clove-brown, narrowly tipped with reddish-white, marked along their outer webs with squarish spots of light red, and on their inner with bars of paler red, the spots and bars not extending to the shafts; the secondary quills and their coverts are like the back. There is more red on the rump, and the tail-feathers are diagonally banded with light red and blackish-brown, with a white tip, the part of each red band close to the shaft being also white. On the occiput are generally some partially white feathers. The fore-part and sides of the neck are transversely banded with blackish-brown and white, more or less tinged with red. The rest of the lower parts, including the wing-coverts, are white, with narrower and more distant bands of dusky; the lower tail coverts reddish-white, with dusky spots and imperfect bars.

The above description is taken from a bird shot in Forfarshire, and having the bill two-twelfths of an inch shorter than that of an adult, with the tail-feathers not fully developed. M. Temminck is therefore in error when he describes this state of plumage as characteristic of the bird when a year old:--"Top of the head, nape, back and all the coverts of the wings transversely barred with deep red and black; quills blackish, terminated by a small white spot; the ovoidal spots of the inner barbs of a reddish-white; on the outer barbs red square spots; feathers of the tail red, marked with diagonal black bands; a broad transverse band towards the end, and all tipped with white; on the shafts small white spots; sides and fore part of the neck of a reddish-white with numerous blackish-bands."

A young bird having the tail and wings yet so short that it was unable to fly, and which was found in the King's Park near Edinburgh, was similar to the above, but with the upper parts darker, and an individual sent to me by Mr Weir in 1838 was coloured in the same manner. At this early age M. Tem-

After p. 135.

2. Cuculus glandarius. Linn. Spotted Cuckoo.

Great Spotted Cuckoo. Plain Cuckoo.

Cuculus glandarius. Linn. Syst. Nat. I. 169.
Coucou geai ou tacheté. Cuculus glandarius. Temm. Man. d'ornith. III. 274
Great spotted Cuckoo. Cuculus glandarius. Jen. Brit. Birds, Suppl. 35.
Cuculus glandarius. Great Spotted Cuckoo. Thomps. Nat. Hist. of Irel. I. 364.

Upper part of the head, including a conspicuous crest of pointed feathers, and cheeks, dark-grey; all the upper parts greyish-black; wing coverts, secondary quills, and tail-coverts, tipped with white; lower parts white, throat and breast reddish.

~~Adult Male.~~ This handsome Cuckoo, which is rather smaller than the common species, has the tail considerably longer, and thus measures somewhat more in length. The crest of pointed feathers and the elongated tail, have been assumed by some as generic characters, this species and a few others having accordingly been formed into a genus, named Oxyophus.

Adult. — "The crest, the whole head, and the cheeks, are of an ash-grey, more or less intense according to the age of the individuals; the shafts of the feathers of these parts have a brown tint, and the base of the web is whitish; a band of a blackish-grey arises near the region of the ears, passes under the occiput, and extends along the nape over the back; the latter part, the rump, the scapulars, and the wing-coverts have a brownish-grey tint, slightly glossed with greenish; the tips of all these feathers is white; the quills are greyish-brown, edged with grey, and tipped with white; all the tail-feathers greyish-brown, tipped with white; the lower part of the neck and of the body are of a more or less pure white, or tinged with red, according to the age of the individuals. Iris yellow; bill black, with the base of the lower mandible reddish, or yellowish. Length from 15 to 16 inches." Temminck.

Habits. — It is said by M. Temminck to inhabit the Barbary coast, Syria, Egypt, and Senegal; to live in Andalusia and the Levant, and to appear accidentally in Sicily, Italy, Provence, and even in some parts of Germany; its habits have not been described, but it is said to form a nest, hatch its eggs, and feed its young.

An individuce was taken in Connemara, in March 1842. A letter from Mr. Brighton of Clifden, in that county, to Mr. R. Ball, affords

the information we have respecting its capture:- "The cuckoo, pursued by hawks, was taken by two persons, walking on the island of Omagh. It flew in a whole in a stone fence or wall, was caught alive, and lived for four days on potatoes and water. The inhabitants of this country had never seen any bird like it before, and as they are constantly in the habit of fishing at Bofin and Arran Islands, if the bird were to be met with, no doubt they would have recognised it. The bird when chased by the hawks, appeared fatigued, weak, and emaciated, as though it had taken a long flight, as woodcocks and other birds of passage do on their arrival."

The specimen, which was sent to Dublin to be preserved, was subsequently obtained by Mr Ball for the museum of Trinity College.

minck describes it as follows:—At the period of leaving the nest, the young have all the upper parts of a greyish-brown; the feathers and quills terminated by a white band; red spots disposed upon the wings, and those of an ovoidal form on the inner barbs of the quills, equally red; a large white spot on the occiput; forepart of the neck and breast marked with very close blackish bands; belly, thighs and abdomen whitish, with black bands as in the adults." It is only however when the feathers are yet short that the upper parts are greyish-brown, with whitish bands, for when they elongate, the red bars appear. Mr Selby's figure of an individual a little more advanced is very inaccurate, for the black bands on the tail are transverse, which is never the case in any young Cuckoo, and the markings in general are very rudely represented.

M. Temminck's account of "the young at the time of leaving the nest" is thus sufficiently correct; but his "Cuckoo at the age of one year," is merely the young fully fledged; and his "young such as they are when they emigrate in autumn" either imaginary, or birds in the first spring, and indeed he elsewhere states that the young do not moult before their departure. His statements as to the "Coucou roux, or Cuculus hepaticus of the systems," are therefore partly incorrect. In this state, as I have shewn, it is merely the fully-feathered young bird, and not "the common grey Cuckoo in its second year." He is aware that this rufous bird is never seen in spring in the northern countries, and therefore he supposes that the Cuckoo during its second year remains in the southern and eastern parts of Europe, where he has often followed them for hours in the beginning of spring. The fact appears to be merely this. The young Cuckoo departs in its first plumage, moults in the south in early spring, revisits its native country in the beginning of summer, when it is grey glossed with green on the upper parts, but has brownish bars on the sides of the neck, and frequently a few of the feathers of the first plumage remaining. In this state many authors have described it as the adult female; but the latter I have found of the same colours as the male; and these grey Cuckoos tinged with red or brown, are both male and female.

2. *Cuculus glandarius.*

Vieill.

COCCYZUS. COWCOW.

Bill nearly as long as the head, slender, arcuato-declinate, broader than high at the base, compressed toward the end, acute; upper mandible with the dorsal line arcuato-declinate, the ridge narrow but obtuse, the sides sloping at the base, convex and erect toward the end, the edges sharp, with a slight notch close to the declinate acute tip; lower mandible with the angle short, the dorsal line slightly decurved, the ridge rather narrow, the sides nearly erect, toward the end convex, the edges sharp, the tip narrow and rather obtuse; the gape-line arcuate.

Tongue very slender, thin, emarginate at the base, with long slender papillæ, the edges toward the end lacerated, the tip rather acute. Œsophagus rather wide, tapering; proventriculus rather large; stomach large, roundish, with the muscular coat very thin, and composed of a single series of small fasciculi; the cuticular lining soft; intestine of moderate length, rather wide; cœca large, oblong.

Nostrils linear-elliptical or oblong, half-closed by a membrane. Eyes of moderate size; eyelids bare, unless at the margin. Feet short; tarsus feathered one-third down, rather stout, with seven very broad scutella. Toes small, broad beneath; the first very small, the third longest, the fourth longer than the second, and reversed. Claws rather small, arched, much compressed, laterally grooved, acute.

Plumage soft and blended; the feathers ovate, with a short plumule. Wings of moderate length, pointed, with twenty quills; primaries tapering and rounded, the first a third shorter than the second, the third longest; secondaries short, broad, rounded. Tail very long, graduated, of ten feathers.

This genus differs from Cuculus chiefly in having the bill more arched, the nostrils linear in place of elliptical, and without a prominent margin, and the tail composed of ten instead of twelve feathers.

COCCYZUS AMERICANUS. THE ~~YELLOW-BILLED~~ COWCOW.

CAROLINA CUCKOO. COWBIRD. RAIN-CROW.

Cuculus americanus. Linn. Syst. Nat. I. 170.
Cuculus americanus. Lath. Ind. Orn. I. 219.
Cuculus carolinensis. Wils. Amer. Orn. IV. 13.
Coccyzus americanus. Audub. Synops. 187.
Coccyzus americanus. Carolina Cuckoo. Jen. Brit. Vert. An. 155.

Bill brownish-black above, yellow beneath; plumage of the upper parts light greenish-brown, the head tinged with grey, of the lower parts silvery white; tail-feathers, the middle excepted, brownish-black, tipped with white.

MALE.—This elegantly formed but plainly coloured bird has occurred so seldom in Britain, that I am obliged to have recourse to specimens from its native country, for its form and plumage, and to the works of Mr Audubon, for its habits. It is considerably inferior in size to the Grey Cuckoo, and of a more delicate form, having the body slender, the neck of moderate length, the head rather small. The bill is slender, considerably arched, and in all respects as described in the generic character. The roof of the mouth is flat; the upper mandible very narrow toward the end, slightly concave, with three longitudinal ridges, the lower deeply channelled. The tongue is very slender, ten and a half twelfths long, horny in the greater part of its length, with the edges lacerated, and the tip rather acute. On the tarsi, which are short, and rather stout, are seven very large scutella, which almost meet behind; the first toe has six, the second eight, the third twelve, the fourth sixteen scutella; the toes are small, and the claws slender and somewhat bluntly pointed. The plumage is blended, on the upper parts somewhat compact and glossy. The third

quill is longest, the second and fifth are nearly equal, and the first is as long as the seventh. The lateral tail-feathers are two inches and a quarter shorter than the middle.

The upper mandible is brownish-black, its basal margins and nearly the whole of the lower mandible yellow, of which colour also is the bare space about the eye. The iris is hazel, the tarsi and toes are greyish-blue, the claws black. The general colour of the upper parts is light greenish-brown, the head tinged with grey; that of the lower greyish or silvery white. the inner webs of the quills are brownish-orange. The tail-feathers, the two middle excepted, which are coloured like the back, are brownish-black, tipped with white, of which colour is nearly the whole outer web of the lateral feathers.

Length to end of tail $12\frac{1}{2}$ inches; extent of wings 16; bill along the ridge $\frac{11\frac{1}{2}}{12}$; along the edge of lower mandible $1\frac{2}{12}$; wing from flexure $5\frac{8}{12}$; tail $5\frac{8}{12}$; tarsus 1; hind toe $\frac{4}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; second toe $\frac{7}{12}$, its claw $\frac{3}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{4}{12}$; fifth toe $\frac{7\frac{3}{4}}{12}$, its claw $\frac{3}{12}$.

Female.—The female resembles the male in colour, and is little inferior in size. One which I examined for Mr Audubon had the œsophagus three inches and seven twelfths long, six twelfths wide at the commencement, gradually diminishing to four twelfths; the proventriculus five twelfths in breadth; the stomach very large, broadly elliptical, compressed, an inch and two twelfths long, one inch in breadth; its walls extremely thin, its muscular coat being formed of a single series of small fasciculi. Being distended with remains of insects, and a great quantity of hairs, it seemed to occupy almost the whole cavity of the abdomen beyond the sternum. The inner coat, or epithelium was soft, destitute of rugæ, red, and stuck over with some of the same kind of hairs as those intermixed with the remains of the insects. The proventricular glands large, cylindrical, forming a belt about nine twelfths broad. The pylorus extremely small, with a thickened margin; the intestine fourteen inches and three quarters long, its width from three and a quarter twelfths to two and a half twelfths; the cœca one inch and eight twelfths long, oblong, narrow at the commence-

ment; the cloaca oblong. The digestive organs are thus in all respects precisely similar to those of the European Grey Cuckoo.

Length to end of tail $11\frac{3}{4}$ inches; to end of wings 9; extent of wings $15\frac{1}{2}$; wing from flexure $5\frac{8}{12}$; tail $5\frac{7}{12}$.

Habits.—The Yellow-billed Cowcow is distributed over the United States of America from Texas to Nova Scotia, and extends into the interior as far as the Rocky Mountains. It breeds in all these districts, which it visits from March to May, retiring about the middle of autumn, although some remain in Florida through the winter. Its habits have been described by Wilson, and Mr Audubon; but in the works of the latter observer are found many particulars relative to its manners and organization not contained in that of the former. To him therefore I have recourse for the following condensed notice respecting it. Moving with a rapid and silent flight from one place to another, it wends its way with ease among the branches, occasionally inclining its body to either side. When migrating southward, it flies high, in loose flocks, but arrives singly in spring, the males preceding the females. Its notes resemble the word *cow*, repeated eight or ten times, whence its name of Cowcow or Cowbird. It feeds on insects and larvæ, occasionally on eggs of small birds; and, in its turn, often falls a prey to the Pigeon Hawk. Berries of many kinds, as well as grapes, afford an abundant supply of food in autumn. On the ground "they are extremely awkward at walking, and move in an ambling manner, or leap along sidewise, for which the shortness of their legs is ample excuse." The nest is flat, formed of sticks and grass, and placed on a horizontal branch, often not far above the ground. The eggs, four or five, are bright green, and of an elongated oval form.

In June 1837, Mr Audubon visited at Charleston, the grounds of Mr Rhett, to examine a nest of this species, in which were found two young birds nearly able to fly, which scrambled off among the branches, but were caught; three others, all of different sizes, one apparently just hatched, another probably several days old, the third, covered with pin-feathers; lastly,

two eggs, one containing a chick, the other newly laid. Mr Rhett stated that in another nest "eleven young birds had been successively hatched and reared by the same pair, in one season, and that young birds and eggs were to be seen in it at the same time for many weeks in succession." Dr T. M. Brewer, of Boston, corroborates this statement, observing that "the female evidently commences incubation immediately after laying her first egg. Thus I have found in the nest of both our Cuckoos one egg quite fresh, while in another the chick will be just bursting the shell; and again, I have found an egg just about to be hatched, while others are already so, and some of the young even about to fly."

Now the stomach of both this species and the Black-billed, which incubate and rear their young, being as large as that of our European Cuckoo, and their food the same, namely hairy worms and insects, the reasoning founded on these facts to explain the peculiar habits of the latter bird, is obviously false. This succession of eggs and young in the same nest at considerable intervals, is one of the most curious phenomena in the history of birds, and nearly as ~~marvellous~~ wonderful as that which has rendered so celebrated the Grey Cuckoo.

An individual of this species was killed in the preserves of Lord Cawdor, in Wales, in the autumn of 1832, and is now in the museum of the Zoological Society of London. Another is stated to have been obtained in Cornwall, and Ireland has furnished two more. The species thus merely ranks with us as a very rare straggler.

Remarks.—Mr Jenyns calls the tarsi of this bird "long," although by his own statement they measure not quite an inch. In the second part of a popular compilation entitled "The Natural History of the Birds of Great Britain and Ireland," published in October 1839, it is said that "for all that we know of its habits we are indebted to Alexander Wilson." On the contrary, all that is related above of its habits is derived from John James Audubon.

Family 11. Caprimulgina.

To p. 627.

Order I. Raptoria. Raptorial Birds.

By the term Raptoria, &c. p. 161, 162.

~~PRACTICAL ORNITHOLOGY~~.

~~*EIGHTH LESSON.*~~

~~EAGLE-SHOOTING. ORGANS OF SENSATION OF THE RAPACIOUS BIRDS; STRUCTURE OF THE EYE, NASAL PASSAGES, EAR, AND TONGUE. ORGANS OF RESPIRATION OF VULTURES, HAWKS, AND OWLS.~~

~~Having examined the series of land birds characterized by their habit of walking or leaping on the ground or on trees, when searching for their food, we now come to those which, in pursuing their prey, are incapable of advancing through the instrumentality of what anatomists call their sacral extremities, but trust entirely to those named the atlantal, although generally they can hop or hobble on the ground, and a few perform there a kind of locomotion not altogether unworthy of being called walking.~~

It is ~~now~~ the early part of summer, and we have anticipated the sun, for while with our guns we advance along the hill side, he still lingers behind the grey mass of granite that obstructs our View of the Minsh. The sandy pastures have assumed a lively tint of green, the yellow pilewort and pink-tipped daisy are scattered profusely around, and the Draba verna strives, half in vain, to ornament the turf of the rude stone-wall, on which are seen a pair of Wheatears, anxious for the safety of their ~~not yet~~ finished nest. Although the Golden Plovers have betaken themselves to the moors, and the Redwings have fled to the north, the mellow notes of the gentle Ring Dotterel come from the pebbly beach, the cry of the Cuckoo is heard on the hill, the Snipe drums away on rapid wing, and the little bays are filled with flocks of Terns, screaming joyously as they pursue the shoals of sand-eels. Hark to the cry of the Corn Crake issuing apparently from that patch of

yellow iris, whose light green leaves are scarcely yet long enough to conceal it; and now bursts from the summit of that moss-clad crag, projecting from the granite vein, the mellow song of the ever-welcome Thrush.

Here on the shore the rocks are clad with a profusion of scurvy-grass, rose-root, and beautiful tufts of sea-pink. Flocks of Rock Doves, mixed with Starlings, issue from the coves at the base of the tall cliff, which seems to frown in scorn on the sullen waves that in vain strive to scale its sides, as they rush gloomily in from the Atlantic. The sun now shoots its bright beams across the shelves of the gneiss rock; having reached the margin of which, let us ascend some hundred yards, and cast our eyes over the wide waste of waters. Far away in the north-west are the dimly-discovered hummocks named the Flannan Isles; nearer is the rock of Gaskir, the resort of multitudes of seals; and still nearer, though yet many miles distant, the little group of the Glorik Rocks, on which thousands of Gulls and Terns rear their young, usually in security, though sometimes plundered by the prowling crew of one of the few boats that venture far upon those desolate seas, where the sight of a ship is a phenomenon that calls forth the admiration of the shepherd, as he rests by the mountain cairn. The frolicsome lambkins chase each other around their dams that are quietly grazing among the heath. See, here is a skin, with the skull and legs appended,—all that has been left by some hungry polecat or raven. Take care, good pupil, for being literally on the brink of a precipice, with about a hundred feet below you the nest of an Eagle, which is itself at least four hundred feet from the water, should you slip, you will spoil our sport.

Surely this heap of stones must be artificial, and yet of what use can it be? That you will find out presently, but in the meantime pull from its side the bunch of heather and get in, while I expose the dead sheep that has been left here on purpose. Now, good pupil, here we are, in the bosom of mother earth; sit thee down, put thy gun in trim, rest its muzzle on the edge of that hole, point it at the dead sheep,

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and fall not asleep, while I read a page or two of this choice book. The eagle has not yet come abroad, and possibly the first thing to attract his notice may be this very carcass.

"The Golden Eagle has ever been associated with majesty or nobility; in ancient mythology, an eagle was alone thought worthy to bear the thunder of Jove. By rude and savage nations he is combined with courage and independence. The young Indian warrior glories in his eagle's plume as the most distinguished ornament with which he can adorn himself. The dress of the Highland chieftain is incomplete without this badge of high degree. And if, by the trammels of system (which, nevertheless, is indispensable, when the number of objects to be arranged exceeds eight thousand) we are forced to place him in an aberrant or less honourable situation, yet, when met with on his native mountains, free and uncontrolled, we cannot refuse the tribute which has been rendered to him by our predecessors." That we sha'n't. Let him but present himself, and he shall have a tribute of buckshot. But here in the bag are some remaining leaves of another valuable book, and as fortune favours the brave, so here we have a sketch of the Golden Eagle. "Their feathers are tinted and tempered in the fury of the blast; and they acquire not their full depth and lustre till they have borne that for four successive winters; and so it would be vain to hope that we could either obtain or preserve them in confinement." Come, mind your gun, and don't stare at me. I read fairly. "Her strength of endurance also enables her to keep her footing and preserve her existence, under circumstances to which the powers and the life of almost any other animal would be obliged to yield. The same elastic ligament, which, of its own nature, and without effort from the bird, compresses her toes in clutching, enables her to cling to the pinnacle of the rock, and to cling the more firmly the ruder the blast. The claws are not used in those cases, as that would injure their points and unfit them for their proper functions; but the pads and tubercles hold on upon places where the foot of all else would give way; and the Eagle sits with closed wings and close plumage, as if part of the rock itself, while the wind roars and the snow drives, tearing the bushes

from their roots, sending them rolling over the precipices, and literally scourging the wilderness with ruin. The strength of the hill ox, the fleetness of the mountain deer, and the resources of the mountain traveller, are often unavailing; and when the storm breaks, the signal of the raven and the crow points out the place of their bones; but the bones of the eagle are not thus given by nature to be tugged at by ignoble birds. Queen of the tempest, she rides as secure amid its fury, as when, on a cloudless and breezeless day, she floats down the valley with easy and almost motionless wing." This may be poetry, but, sure I am, it is not natural history. I have seen an Eagle abroad in a tempest, on this very coast, and a sad time she had of it, for when the blast came upon her unawares, she was driven about by it, with ruffled feathers, until she recovered her position and faced the wind. While all the time a Raven and some Gulls seemed to enjoy the exercise of labouring with strong beats against the breeze, then with upturned side giving way to it, bearing up again in an eddy, now shooting high, then slanting downward, the Eagle was glad to make the best of her way to a shelf of the rock. I have seen storms here, that constrained the very Cormorants and Rock Doves to remain for days in their caves, and then, be assured, no Eagle was abroad.

A Black-backed Gull has alighted near the carcass. How prettily it walks with its small steps as it eyes the carrion with apparently some apprehension. Do you think it smells us? Shall I fire?—No, it will help to entice the Eagle, which may observe it from a distance. The Gull sees something, as you may perceive by its turning its head to one side, and looking wistfully upwards. Heard you not the croak of the Raven? Ah! there thou art, thou old prowler! Many hard winters hast thou struggled through, and yet there thou art as grave and fierce as ever, with thy glossy plumes glittering in the morning sun. Approach, fear not, for thou shalt receive no harm. There he stands on a tuft, eyeing the dead sheep, and now bending his body forward, he croaks aloud. Presently his mate will be here. The Eagle too, knows the signal croak of the Raven. Should he come, let

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him settle on the carcase, and then let fly. In the meantime it is amusing to watch the carrion birds. The Gull walks about, scarcely venturing a tug, but the Raven, alighting on the head, strives to pick out an eye, which he has now done. Having gulped it down, he croaks again, and is joined by another. They tear up the flesh in morsels, and seem to enjoy their good fortune, yet not without fear, for every now and then they listen and cast a glance around.—There, they are all off. Some sudden alarm. Have they not smelt us?—No, they have seen a dog, or a shepherd, or an Eagle; they have not gone far.—Beautiful bird! thou wert worthy of being the thunder-bearer of Jupiter! There thou standest perched on the ribs of that dead sheep, and gatherest up thy large wings, and erectest thyself, casting a glance of pride on those birds which thy presence has awed.—But the explosion puts an end to admiration, and the smoke has obscured the view; let us out, and see what the buckshot has done to those "muscles which are as firm as pieces of cable, and their tendons almost as rigid as dried cat-gut."

Having a greater regard for birds than to view them merely as shapes (species), and therefore being desirous of ~~promoting~~ knowledge as much as possible of their structure, I here present a short account of the organs of sensation of Mute Raptores, I am well assured that whoever will examine the parts here described for himself, will find the occupation far more agreeable and instructive than ~~merely~~ the mere inspection of the exterior.

~~Returning from this imaginative digression, we may now~~ examine the organs of sense in a bird of the rapacious family.

A bird ~~One~~ well suited for ~~this~~ one purpose is the common Buzzard, which is sufficiently large to enable us to see the different parts of the organs in a satisfactory manner, and not so rare but that a person desirous of verifying our observations may contrive to procure a specimen. In the head of this bird, ~~of which one has just arrived from Dr Robertson of Dunkeld~~, Plate XVII, Fig. 1, we observe externally, the upper mandible, *a*; the lower mandible, *b*; the tongue, *c*, with the aperture of the windpipe at its base; the palate, *d*, having in its median line, the long slit, placed opposite the aperture of the glottis, and into which, when the mouth is shut, the air passes into the canal of the nose; the cere, *e*, or bare skin at the base of the upper mandible, in which are perforated the nostrils; then the eyes, over which are the supraocular ridges; and lastly, the external aperture of the ear, concealed among the plumage. Let us now examine these parts in succession.

The Eye.—The aperture left between the eyelids, when the bird is awake, is of a circular form, half an inch in diameter. There are two canthi, or angles, slightly marked, an anterior or inner, and a posterior or outer. Of the eye itself the cornea, or transparent part, projects considerably, and through it we perceive the iris, an annular membrane of a yellow colour, surrounding a circular space, the pupil, through which the black colour of the interior of the eye is seen. The eye is defended externally by the *Eyelids*, of which there are two, an upper and a lower. Over the latter is a thin ridge, projecting horizontally, and named, from its position, the *Supraocular Ridge*. It is produced by a thin flat bone, appended to the frontal, and at its outer edge is covered by a dense bare skin, like the cere. The *Upper Eyelid* is formed externally of skin, covered with small soft feathers, internally of a thin layer of a fibrous structure, and a delicate membrane continuous with that of the anterior surface of the eyeball, and therefore named the conjunctiva. It has a bare crenate margin, fringed externally with small bristles, which are the prolonged shafts of feathers. This eyelid is very thin, having no cartilage, and so narrow as not to cover more than a fourth of the eye when closed. The *Lower Eyelid* is much larger, covers three-fourths of the eye, and is similarly constructed, but on turning it out, Fig. 2, so as to examine its inner surface, we find interposed between the fibrous layer and the conjunctiva, a concave, yellowish-white, dense, thin, flexible, cartilaginous plate, of a circular form, which, when the lid is raised, exactly covers the cornea or transparent part of the eye. Its principal object seems to be to give firmness to the eyelid; but may it not also be intended to prevent, when the bird is asleep, the transmission of light through it? The eyelids are closed by means of a thin orbicular muscle, which surrounds the eye, and is attached to the inner edge of the orbit. A small muscle, the *levator palpebræ superioris*, arising from the upper part of the orbit internally, and attached to the hind part of the upper eyelid, raises it up. The lower eyelid is depressed or drawn down by a corresponding muscle, the *depressor palpebræ inferioris*.

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Removing these parts, we come next to a membrane lying in its folded state, Fig. 4, along the upper and fore edge of the eye, but capable of being stretched out so as entirely to cover the external surface of the organ. Fig. 3 represents this organ, the *Membrana nictitans*, which is formed by a reduplication of the tunica conjunctiva, and is frequently designated by authors as a third eyelid. The lower eyelid turned down is seen at *a*; the posterior bony edge of the orbit at *b*, the eyeball covered by the conjunctiva at *c*, the cornea, through which are seen the iris and pupil, at *d*. The nictitant membrane, *e f g*, is drawn over two-thirds of the eye. It is seen to advance backwards in an oblique manner, with a semicircular edge, and having at its lower part a very slender tendon, which passes over the edge of the eyeball, in a sheath. But to understand this mechanism, we must remove the eye, carefully separating its muscles. In Fig. 6 is seen a small triangular muscle, *a*, named the *pyramidalis*, arising from the lower and fore part of the back of the eyeball, and of which the tendon curves over the optic nerve, and passing downwards over the edge of the eyeball, ascends in front, and is found to be that of the nictitant membrane, which we were tracing. This position of the pyramidalis is perhaps rendered necessary by the great extent of the movement of the nictitant membrane, the tendon of which, unless curved, would be too long to be conveniently disposed of. But the optic nerve, being immediately below the curve of the tendon, would be liable to be injured by it, were it not for a peculiar contrivance. A broad thin muscle, *b*, of a somewhat square shape, and therefore named *quadratus*, arises from the upper part of the posterior surface of the eyeball, proceeds downwards and backwards, and terminates in a thin edge, of ligamentous tissue, in which is a sheath, for the reception of the tendon of the pyramidalis. The quadratus muscle acting simultaneously with the pyramidalis, the tendon of the latter is carried in an arch quite clear of the optic nerve. The nictitant membrane being attached by its upper and anterior margin to the eyeball, and folding up in consequence chiefly of its elasticity, and partly by the action of some muscular fibres, forms no impediment to the motions of the eyeball. To bring

it over the eye effectually and expeditiously, so as not to obstruct vision for an instant, the tendon attached to its free or posterior edge might be placed high toward the outer edge of the orbit; but when the membrane was retracted, the tendon would be across the eye, or would require some mechanism inconsistent with the free use of these parts. The tendon is therefore carried over the edge of the eyeball, and as it must be drawn upwards, it is attached to a muscle, the quadratus, placed high on the eyeball; but as this direct connexion would leave the tendon too short, it is continued farther, curves downward, and ends in another muscle placed near the lower and anterior edge of the eyeball. The uses of the membrana nictitans are to clear the eye of extraneous objects, as dust, accidentally introduced, to moisten its surface by diffusing the lachrymal fluid over it, and occasionally to protect it from the light.

Having removed from the orbit, or cavity in which it was contained, the *Eyeball*, we observe that it is of enormous size in proportion to that of a quadruped, being an inch and one eighth in diameter. Its form is not globular, but composed of two segments of unequal spheres, and an intermediate portion. Viewed anteriorly, Fig. 5, it presents the transparent convex cornea, the iris and pupil; a dark coloured rim to which the cornea is attached, like a watch-glass in its case, then a circle of bony plates, included in the fore part of the rough glistening membrane, or sclerotica, which bounds the posterior part of the eye. Viewed from behind, Fig. 6, it presents a small segment of a large sphere formed by the sclerotic coat, the optic nerve, cut across at its entrance into the eye, and the muscles by which the eyeball is moved. Of these there are six, four straight, and two oblique. The *recti*, or straight muscles, arise from the bottom of the orbit, around the aperture for the passage of the optic nerve, and are attached to the eye by thin tendons, of which the fibres blend with those of the sclerotic coat. The *rectus superior*, marked *c*, by pulling down the upper edge of the eyeball, directs the axis of the eye upwards, and is thus named *attollens oculi*. The *rectus inferior*, or *deprimens*, *d*, has the opposite effect. The *rectus posticus*, *externus*, or *abducens*, *e*, directs the axis of the eye outwards, while

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the *rectus anticus*, *internus*, or *adducens*, *f*, directs it forwards. Acting simultaneously, these muscles would by compressing the sclerotic coat, produce an effect upon the internal parts which will be afterwards explained. The two oblique muscles arise from the inner or fore part of the walls of the orbit, and are inserted in the same manner as the recti: the *obliquus superior*, *g*, and *obliquus inferior*, *h*, of which the action is to direct the eye forwards.

Viewing the eyeball laterally, as in Fig. 7, we observe that its posterior surface forms the segment of a sphere, of which the radius is seven and a half twelfths of an inch, while the anterior or transparent part forms the half of a sphere, of which the radius is three twelfths and a half. These two segments are united by an intervening portion, convex in the greater part of its extent, but concave toward the anterior part. We have now to examine the structure of the ball of the eye.

The dense membrane or coat which inverts the posterior part of the eye, as far as the cornea, *b b*, is named the *Tunica sclerotica*, on account of its comparative hardness. It is rather thin, firm, somewhat elastic, and of a glistening bluish white colour. Although, according to authors, divisible into three layers, it seems to me to be separable into two only, of which the inner is transparent, and of an almost horny hardness. But at its anterior part, *c c*, it is strengthened by a broad belt, composed of a series of distinct flat bones, overlapping each other by their edges, and interposed between the inner and outer membranes. At the anterior edge of this bony circle, the membranous structure is resumed; and lastly, there is a thickened margin of the same nature, but of a dark colour, *b b*, to which the remaining convex part of the outer coat of the eye is attached.

Before describing the sclerotic bones, we may examine this anterior membrane, *b b b*, which, on account of its bearing some resemblance to clear horn, is named the *Tunica cornea*. It is of considerable thickness, and has its outer and inner layers of denser structure than the intervening portion. Being perfectly transparent, it allows the free transmission of the rays of light to the interior of the eye. It is so firmly attached to

the anterior edge of the sclerotica as to seem continuous with it; but some have supposed it to be inserted as if into a groove.

The *Sclerotic Bones*, represented by Fig. 8, are in this eye fifteen in number, and, although not precisely equal in size, arranged in a particular manner. The lowermost, *a*, overlaps those next to it with both its margins; the next on the right hand overlaps by its right margin its successor, and all the rest lie in the same relative position, to the number in all of nine, exclusive of the first, until we come to that marked *c*, which is analogous to *a*, being overlapped by those on each side of it. From *a* to *c*, there are only four, exclusive of these two, which overlap it in the same manner as the nine on the other side, but in the contrary direction. The bone opposite to *a* is *b*, and were the arrangement symmetrical, ought to be the central; but the two key-bones of the arch, *a* and *c*, are not opposite to each other.

Let us now make a vertical section of the eyeball, and take note of the appearances disclosed, Fig. 9. Here we observe first the external coat, the *sclerotica*, *a*; within it a delicate layer, the *choroid coat*, covered with a dusky substance, the *pigmentum nigrum*, *b*; anteriorly, and commencing at the posterior edge of the sclerotic bones, a zone having a plaited or fibrous appearance, *c*, which at its anterior margin is attached to the *lens*, *d*, a round, considerably flattened, transparent body; then another zone coming off near the base of the cornea, or the *iris*, *e*, having a circular hole in its centre, the *pupil*; and, lastly, the anterior transparent coat of the eye, or the *cornea*, *f*. The *optic nerve* is seen at *g*, penetrating the sclerotic coat, entering an oblique sheath, and reappearing internally in a narrow slit, *h*; from the side of which rises an elongated plaited membrane, *i*, named the *pecten*. The optic nerve, on entering the eye, expands into a very delicate pulpy layer named the *retina*, or net, which however is not a very appropriate term, it being not a piece of net-work, but a delicate pulpy substance.

This internal cavity of the eyeball is filled with fluid contained in a filmy transparent membrane. The space behind the lens, *d*, is occupied by a fluid named the *vitreous*, or glassy; and that anterior to the lens is filled by another named the

aqueous, or watery, which is divided into two portions by the iris; the space from which to the cornea, *f*, is named the *anterior chamber* of the aqueous humour, while that from the cornea to the lens, *d*, is named its *posterior chamber*. Let us now examine these parts a little more minutely.

The *Choroid Membrane*, *b b*, is a filmy layer, which lies immediately within the sclerotic, and extends as far forward as the *ciliary circle*, *c*. It is profusely covered with a substance of the colour of China ink, named the *pigment*.

Within the choroid coat is the *Retina*, which is the pulpy expansion of the optic nerve, and the seat of the sensation of sight. It extends over the greater part of the choroid coat, but being extremely delicate, is apt to be in a great measure destroyed in examining the parts. As already mentioned, the optic nerve, *g*, in entering the eye becomes suddenly attenuated, and presents itself internally of a linear form, in a fissure of the membrane, *h*, from which the retina expands.

At this point is a body or part peculiar to the class of birds, varying in form and extent in the different species; but in the Buzzard, presenting the appearance of a delicate membrane, nearly four-twelfths of an inch long, three-twelfths in height, and composed of twenty plaits, disposed in the manner of a frill or ruffle. On this membrane, once considered as muscular, and named the *musculus pectinatus*, are ramified the branches of the ophthalmic artery, which enter along with the optic nerve. Its uses are not known.

Opposite the posterior margin of the circle of sclerotic bones, the choroid membrane divides into two laminæ, of which the inner becomes much thicker, and forms a broad zone of radiating fibres or plicæ, covered with black pigment, and of which the central extremities adhere to the lens. This zone, *c*, is named the *Ciliary Circle*. The outer layer of the choroid membrane proceeds forward, and unites with the *Iris*, *e*, which is a broad zone, composed of fibres, of which those of its outer part radiate toward the pupil, while the inner, or those surrounding the pupil, are circular. This membrane is extremely contractile and dilatable. When the radiating fibres contract, the pupil is enlarged, and when the circular fibres contract, it is reduced in size.

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We have still to examine the fluids or humours of the eye, of which there are three.

The *vitreous humour*, which fills the space behind the lens and ciliary zone, is a transparent, somewhat gelatinous watery fluid, enclosed in a membrane, named the *hyaloid*, and intersected by filmy laminæ or cellules, so that an incision into the membrane does not cause the whole of the fluid to escape. The pecten projects into the midst of this humour, generally terminating somewhat behind the lens, but sometimes reaching it.

The *chrystalline humour* is that which, with its capsule, constitutes the *lens*. This body is of a round, somewhat flattened form, its posterior surface more convex than the anterior. Fig. 10, *a*, represents it as viewed laterally; *b*, as seen from before. Its capsule, or coat, is much denser than that of the other humours. Although the contents of this capsule are fluid, the central parts are much denser than those toward the exterior.

The *aqueous humour*, or that which fills the part anterior to the lens, is perfectly limpid, and, like the vitreous, enclosed in a delicate capsule or membrane.

Omitting here any account of the blood-vessels and nerves with which the eye is supplied, I may briefly explain the manner in which vision is effected. The retina, or expansion of the optic nerve, at the bottom of the eye, is the part which gives the sensation of light; and the other parts of the eye are intended for collecting and modifying the rays emanating from objects, so as to produce, through the retina, an image of these objects. Rays of light being deflected from their course in passing from a rarer into a denser medium, those proceeding from an object, and passing through the cornea, are made to converge in a small degree. If the rays are too numerous or intense, they are diminished by the contraction of the pupil, which, on the other hand, enlarges when the rays are scanty and the light feeble. The rays to which the pupil gives admittance now penetrate the chrystalline lens, which being a dense body with two convex surfaces, refracts them so as to cause them rapidly to converge as they traverse the vitreous humour. The parts of the organ are so adjusted that the focus

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or point at which the rays meet falls exactly on the surface of the retina at the bottom of the eye. The whole surface of the posterior chamber of the eye being lined with a black substance, absorbs all the rays that would otherwise by being reflected cause an indistinctness in the image produced. The objects placed within the range of vision are represented on the retina in an inverted position; and many physiologists have supposed that it is the picture on the retina that is perceived by the sensorium; hence they have puzzled themselves to account for the erect appearance of erect objects; but there is no reason whatever for imagining that the picture which we perceive formed on the retina of an eye of which a portion of the sclerotic and choroid coats have been cut out, is what in the natural state of the organ is observed by the mind. All that can be safely said on the subject is simply that the rays of light reflected from objects are in the eye arranged so as to produce on the delicate expansion of the retina an impression which is conveyed by the optic nerve to the sensorium.

The eyes of birds vary considerably in form, the convexity of the cornea and lens being greater or less, and the proportions of the other parts undergoing alterations. Thus in Owls, the sclerotic zone is so large as to occupy more than a third of the length of the eyeball, to which it gives somewhat of a cylindrical form. In the Pelicans, the sclerotic zone is narrow, and the cornea much less convex than in Hawks and Owls. But the manner in which the focus of distinct vision is adapted to distant and near objects is not well understood, and at all events does not at present require our attention. The degree of convexity of the cornea cannot have much effect, and does not appear to be liable to much alteration in the same individual; but if the convexity of the lens may be increased or diminished, or its distance from the retina altered, the eye can obviously be thus adapted to various distances.

There still remain to be noticed some glandular organs, which are situated within the orbit. The *lachrymal gland*, which is situated near the outer angle of the eye, is of a somewhat elliptical form, and small size. The fluid which it secretes having moistened the surface of the cornea, is received into two

minute apertures at the inner angle, which lead to a short duct that conveys it to the nasal cavity. The *Harderian gland* is larger, composed of a cluster of lobules or mucous follicles, and is situated near the inner angle of the eye. Its fluid, which is poured out by a single duct opening beneath the nictitant membrane, also serves to moisten the eye.

The Organ of Smell.—Let us now make a vertical section of the head, in the direction of its middle line. We thus obtain a view of the brain, the walls of the cranium, the septum between the eyes, the cavity of the nose, and the cells of the mandible, together with some other parts. The olfactory or first pair of nerves are those by which the impressions of odorous particles are conveyed to the brain. Their filaments are dispersed over a delicate vascular membrane, which lines the interior of the nose, and is enlarged by being extended over certain prominences named the turbinated bones.

In this section then, Plate XVIII, Fig. 1, we observe the walls of the cranium, varying greatly in thickness, *a b c d*; the *brain*, divided into the cerebellum situated below and seeming to form the larger portion, from *a* to *b*; the *cerebrum*, or upper portion *b c*; and the *optic lobe* in front, between these two portions, *e*. The cerebrum is by far the largest portion of the brain, it being more extended in breadth than the cerebellum. Besides these parts are seen: the *pharynx* or passage from the mouth into the gullet, *f*; the aperture of the *glottis*, *g*; the *tongue*, *h*, with the right branch of the hyoid bone at its base; the median outline of the palate, *i j k*. The passage from the posterior aperture of the nares, *i j*, opening opposite the glottis, *g*, is seen extending obliquely upwards and forwards, taking a somewhat winding direction, to the nostril, *l*. In the upper part of this cavity, which is enlarged, and recedes backward from the nostril, are three prominences: one of a somewhat roundish form, *m*, hollow, membranous, nearest the brain, and placed opposite the anterior part of the orbit; one of an elongated form, lying in the direction of the nasal passage, formed of a somewhat cartilaginous plate, *n*, once rolled upon itself, and by its upper edge attached to the

outer wall of the nasal cavity; and a very small fold, *o*, close upon the nostril.

On the surface of these parts is extended a delicate vascular membrane, bedewed with a mucous fluid. The nasal cavities are separated by a septum, which is covered with the same membrane. The prominences, *m n o*, are attached to the outer wall, not to the septum. Although the analogous parts in the mammalia are supported by osseous plates, named turbinated bones, these prominences being always membranous or cartilaginous in birds, ought to be named *turbinated bodies*, rather than *bones*. The *olfactory nerve* comes off from the anterior prominence of the cerebrum, at *p*, proceeds directly forwards in a bony tube, and entering the cavity of the nose at *m*, is distributed upon the upper turbinated body, and the septum of the nostrils. The passage from the posterior nares to the anterior is subservient to respiration. Its upper part, from *m* to *o*, being formed as in the mammalia, in which observation and experiment have shewn it to be the seat of smell, must be subservient to the same purpose. But although the parts are thus obviously adapted for the perception of odours, it does not appear that birds possess that faculty in a very remarkable degree. It is indeed doubtful whether it be of any use to them in discovering their food.

No bird is destitute of eyes, or furnished only with imperfect organs of sight; but there are birds in which the nostrils are wanting, as I have ascertained by careful dissection. Such are the Gannets and Cormorants.

Besides the olfactory nerve, there is seen passing across the nasal cavity, a nerve, *e m k*, much larger than the olfactory. It is a branch of the fifth pair, which coming off from that nerve presently after it emerges from the brain, passes obliquely upwards and forwards, crosses externally the olfactory nerve at its entrance into the nasal cavity, then descends, crosses that cavity, and entering amidst the cellules of the upper jaw, divides into numerous filaments, which are distributed chiefly to the roof of the mouth. It is probably subservient to the sense of taste.

The Ear.—In the Buzzard, as in all the birds of the Falconine family, the external aperture of the ear is of an elliptical form. Its margin is fringed with slender feathers, of which the anterior lie over and protect it from injury, or prevent the entrance of dust or other objects. From this external fringed aperture, Fig. 2, *a b*, which we slit open behind, there proceeds obliquely backwards a short passage, the *Meatus auditorius externus*, having at its base anteriorly an elliptical space, *c*, covered with skin. Immediately behind this, and placed obliquely so as to incline backwards and outwards, is a delicate, semitransparent membrane, *d*, of an elliptical form, about four and a half twelfths of an inch in its greatest diameter, convex externally, or rather presenting the appearance of a short cone, its apex being supported by a small bone placed internally. In the natural state of the parts, this membrane is concealed by a muscle, *e*, inserted into the lower jaw, and here cut across and put aside. From its resemblance to the parchment of a drum or tambour, stretched in a circular frame, it is named the *Membrana tympani*. Behind it is a cavity, of the same width at first, but gradually, though irregularly narrowing. This cavity, named the *Tympanum*, or drum of the ear, is lined with a delicate membrane, and, although closed by the membrana tympani externally, communicates with the external air by means of a bony canal, the *Eustachian tube*, which opens into the hind part of the posterior aperture of the nares. It also communicates by three apertures with the cells in the substance of the cranium, and by two is connected with the more internal parts of the organ. The cavity of the tympanum contains air. There is situated in it a slender bone, of which the base, a roundish flattened disk, fills one of the two apertures above mentioned, while the tip, having three cartilaginous processes attached to it, rests against the membrana tympani, and causes it to protrude. It is moved by a slender muscle attached to its outer extremity, and counteracted by two tendinous cords. The internal cavity of the ear, which is filled or bedewed with an aqueous fluid, is of an irregular form, and communicates with three curved bony tubes, lined with a membrane, and

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filled with fluid. These are named the *Semicircular Canals*, of which, in this bird, the largest is the posterior, or superior, *f*, and has a vertical position; the anterior, *g*, is next in size, and in crossing the middle one, *h*, communicates with it. At their entrance into the vestibule these canals have an enlarged space, named the *Ampulla*. In man and the mammalia, there is moreover a large spiral cavity divided longitudinally by a partition into two cavities, which communicate at the tip; but in the Buzzard all that represents this part is a small oblong space, having internally two cartilaginous cylinders, which divide it into two cells, one of which opens into the vestibule, while the other communicates with the membrane closing the foramen rotundum of the tympanum.

As in the eye the retina or expansion of the optic nerve receives and conveys to the brain the impression of light; so the delicate fibrils of the auditory nerve distributed over the inner surface of the internal cavity of the ear, receive and impart to the brain the impression of sounds. Bodies which emit sound by being thrown into a state of vibration, communicate to the air impressions causing a peculiar motion of its particles. The air thus acted on is admitted by the external aperture of the ear, and strikes against the membrane of the tympanum, the slender bone attached to which communicates the impression to the internal ear, in which the extremities of the auditory nerve receive it, and convey it to the brain. But of the manner in which the perception of sounds is effected we know very little. Fig. 3 represents the external aperture of the ear in the Peregrine Falcon.

Having thus partially examined the organs of sight, smell, and hearing, we may now advert to those of Taste and Touch. In man and the mammalia generally, the tongue is the *Organ of Taste;* and in birds it must be so too; but they seem to possess the faculty only in a very imperfect degree. As birds do not masticate their food, but the moment the object or morsel is seized, swallow it entire, their tongue is more an organ of prehension than of taste, and is generally more or less sheathed

with a horny substance, and at the base furnished with conical papillæ similarly sheathed.

As to the *Organs of Touch*, there seems to be no other part than the bill that can be specially referred to as subservient to this faculty. The skin is sentient, but receives impressions only through the medium of the feathers. The bare skin of the feet and cere is never employed as an organ of touch, for which purpose it is obviously ill adapted, being generally much thickened and callous. In all birds the bill is more or less employed as an organ of touch, and in many, as Snipes and Ducks, is abundantly supplied with filaments of a branch of the fifth pair of nerves.

These observations will suffice to introduce the organs of sense to the notice of the student of Ornithology, who, with the aid of the treatises on Comparative Anatomy, and multiplied dissections made by himself, may easily acquire a sufficient knowledge of the subject.

The Respiratory Organs of the Rapacious Birds may now be briefly alluded to. I find nothing in the lungs that differs in any remarkable degree from what is observed in the other land birds. The trachea is, in all the species examined by me, considerably flattened, of nearly uniform diameter, or somewhat tapering, with numerous rings, which are usually slender, and rather cartilaginous than osseous. In the Vultures, the inferior larynx, Plate XIX, Fig. 1, *c c*, is much flattened, and the trachea bifurcates, *b*, without having its last ring furnished with a partition; the bronchial half-rings, *c d*, are few and very slender, and the lower portion of the bronchi, *d e*, is entirely membranous. The lateral muscles, *f f*, of the trachea are large, and terminate in the sterno-trachealis, *f g*, *f g*, without being prolonged in part so as to form a pair of inferior laryngeal muscles. In three respects, then, the trachea of the Vultures differs from that of the Hawks and Owls; namely, in having no bone of divarication, in being destitute of inferior laryngeal muscles, and in having a large portion of the bronchi membranous.

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In the Falconine Birds, or Eagles and Hawks of all kinds, the last entire ring of the trachea, Fig. 3, is furnished with a septum; the lateral muscles, *i j*, which are generally strong, terminate in two slips, one, *j k*, forming the sterno-trachealis, the other, *j f*, passing to the last tracheal ring, or the membrane intervening between it and the first bronchial ring. The bronchi are furnished with slender half-rings in their whole length, *g h*. The upper larynx, Fig. 8, has on each side of the aperture of the glottis, an external muscle, *a*, the apertor, and a smaller inferior muscle, *b*, the constrictor. In this respect it does not differ from that of the Vultures and Owls.

In the latter birds, the trachea is very short and wide, with remarkably slender, cartilaginous rings, Fig. 9. The lateral muscles, *i j*, which are rather slender, divide, as in the Hawks, into two, the sterno-tracheal, *j k*, and inferior laryngeal, *j f*. The last entire ring has a septum, and the bronchi are very short and wide, with slender half-rings in their whole length.

It seems difficult to conjecture why the Vultures should be, properly speaking, destitute of inferior larynx. What is there in their voice or respiration that renders an inferior laryngeal muscle, or a division of the last tracheal ring, inexpedient? Such questions tend to shew that much remains to be studied in the anatomy and physiology of birds.

As I remarked in the first edition of this work,—

Observations like these may appear unnecessary to the persons who view birds merely as composed of skin and feathers; but ~~to them I now cease from addressing myself. They will gradually disappear from the earth, and their place will be occupied by~~ men who will study birds as organic beings. The attempt which I have made to establish a rational method of study in this most interesting department of science, ~~however feeble it may be,~~ will yet form, I am well persuaded, the commencement of a new era among my countrymen, whom I hope yet to see perfecting my favourite study to ~~such~~ a much higher degree ~~as to render these volumes antiquated and effete. For my own part,~~ I am well pleased to think that my labours, ~~however little appreciated by such of my contemporaries as evidently conceive themselves to be the sole depositaries of ornithological know-~~

I address myself to

For my own part

~~ledge~~, will be productive of beneficial results, inasmuch as they will stimulate to increased exertion some of those young and ardent naturalists who, ~~to my certain knowledge~~, have derived pleasure from ~~even the rude attempts at~~ observation of so humble an individual as myself.

Let us now proceed to examine the Rapacious Birds ~~of our beloved country~~. On that bleak pinnacle of columnar greenstone is perched the ever-watchful Sea-Eagle, while that misnamed the Golden sails in widening circles over the summit of the snow-patched hill. The shrill cry of the Kestrel issues from the ivied crag, and the Sparrow Hawk glides like a meteor over the green thicket. Forms of beauty present themselves on every side, and behind them is a band of nocturnal plunderers, which we must endeavour to see in more animated postures than those assumed by them now, when the glare of day, hateful to their eyes, is to us reflective of all the loveliness of nature.

Although Science peremptorily rejects Imagination, when she attempts to distort facts, she occasionally calls in her aid, when she finds it expedient to make a strong impression on the mind, by presenting a picture of which the details, correct in themselves, might not perhaps occur in the same combination to the individual addressed. We may thus, without any impropriety, make a short excursion.

Of in the early part &c. p. 141. — to "dried cat-gut. p. 145.

Take back to p. 141.

~~I.~~ ORDER I. ~~IX.~~ ~~RAPTORES.~~ ~~PLUNDERERS.~~

~~By~~ the term Raptores ~~may be~~ designated an order of birds, ~~the~~ predatory habits ~~of which~~ have obtained for them a renown, ~~exceeding that of any other tribe, with the exception of those species, essentially differing in disposition, and more important in an economical point of view, which are~~ known collectively as the Rasores or Gallinaceous Birds. All the species of this great class are in some sense plunderers, but those ~~which we now have to examine~~, being characterized by a form and combination of organs adapting them for seizing and devouring ~~quadrupeds, birds, reptiles, and~~ other animals, seem peculiarly entitled to the appellation. The most obvious peculiarities by which they are distinguished from other groups are ~~observed~~ in their hook-pointed bill, and long, curved, acuminate claws. In form and magnitude they vary exceedingly, some being of great size ~~or~~ very robust, while others are ~~remarkably~~ slender or diminutive. In the proportions of their wings and tail, as well as in the texture and development of their plumage, they have scarcely any common character ~~besides~~ that of being in every case furnished with powerful organs of flight. Even their digestive apparatus, although in some essential respects uniform, presents several striking modifications.

In general, the tongue is short, fleshy, concave above, rounded or emarginate; the œsophagus very wide; the proventricular glandules forming a complete belt; the stomach large, roundish, with a thin muscular coat, composed of a single series of

large fasciculi of fibres, and a soft epithelium ; the intestine of moderate length and width, or very long and narrow, with the cœcal appendages rudimentary or wanting, but in one of the families large ; the cloaca always globular and of great size.—See Plates IV, V, XX, and XXI.

The tarsi vary much in length and thickness ; ~~and~~, being sometimes feathered, more frequently bare, with either small scales or large scutella in front, present no common character. The toes are always four, placed on the same level, padded and papillate beneath ; but they vary in length, thickness, relative size, and direction ; and the claws, although generally large, very acute, and well curved, differ considerably in the different genera.

Birds of this order occur in every country, but of the ~~three~~ families into which they may be arranged, one, that of the Vultures, is peculiar to the warmer regions, so that in Britain the appearance of such birds is merely accidental, and as yet only ~~a single~~ instance ~~is~~ on record. The *Vulturinæ*, characterized by a bill of moderate length, having the base cerate and the tip decurved, an ovato-oblong head, which, with part of the neck, is destitute of feathers, very ample wings, anterior toes webbed at the base, claws large and moderately curved, gradually pass into the second family, ~~or that~~ composed of Eagles and Hawks. In this family, the *Falconinæ*, the bill is short and stout, with the base cerate, the tip elongated and decurved ; the head large, broad, and feathered ; the wings very long and broad ; the claws very large, much curved, and extremely acute. The *Strigina* or Owls are for the most part nocturnal, and are distinguished by their excessively large roundish head ; very short cerate bill, of which the tip is elongated and decurved ; extremely developed eyes and ears ; very soft plumage, long, broad, and rounded wings, and feathered tarsi and toes.

VULTURINÆ.

VULTURINE BIRDS.
~~VULTURES AND ALLIED SPECIES.~~

The occurrence of birds of this family in Britain being limited to a ~~single~~ instance, it is not expedient to enter into very minute details respecting their structure and habits. The only species which I have had an opportunity of examining as to their digestive and respiratory organs, are the two, among the smallest of the order, which occur in the southern parts of North America. Three other species peculiar to that continent, and ~~four~~ of those belonging to Asia and Africa have come under my observation in the living state or in the form of prepared skins. The general characters derived from the comparison of these are as follows.

The body robust; the neck rather long; the head rather small, ovato-oblong, and, with part of the neck, destitute of feathers. Bill of moderate length, generally stout, sometimes rather slender; the upper mandible with a bare skin or cere at the base, compressed, with the tip elongated, decurved, rather obtuse, but thin-edged; lower mandible rather slender, with the extremity rounded and thin-edged. Tongue of moderate length, concave above or induplicate, rounded or slightly emarginate. Œsophagus very wide, and dilated into an enormous crop; proventricular glandules forming a broad continuous belt; stomach large, moderately muscular or very thin, with a soft rugous epithelium; intestine of moderate length and width; cœca wanting.

The trachea of the Vultures differs from that of the Eagles and Hawks in several respects, while it agrees with them in being considerably flattened, somewhat tapering, and composed of slender rings. The inferior larynx is remarkable for being much flattened, and for bifurcating without having a septum

to its last entire ring, while the bronchi are partly membranous. The lateral muscles, which are large and of great breadth, so as to cover the anterior surface, terminate in the sterno-tracheales, so that there are no inferior laryngeal muscles. In Pl. XIX, Fig. 1 represents the inferior portion of the trachea of Cathartes Aura of the natural size, *a b*; the bifurcation, *b*; the last entire ring, *c c*; the ringed part of the bronchi, *c d*, *c d*; the membranous portion, *d e*, *d e*; the lateral or contractor muscles, *f f*, ending in the sterno-tracheales, *g g*.

The sternum, Fig. 211, p. 169, as represented by that of Cathartes Aura, has two notches on each side behind, the crest more elevated in the middle but less so anteriorly than in the Hawks.

Eyes of moderate size, without projecting superciliary ridges. Aperture of ears rather small and simple. Tarsus stout, bare, shorter than the middle toe; hind toe small; second a little shorter than the fourth; claws large, moderately curved, acute, or blunted by use. Plumage full, rather compact, the feathers ovate, those on the neck lanceolate. Wings very long, broad, with the third, fourth, and fifth quills longest; tail of moderate length.

These birds inhabit the tropical and temperate regions of both continents, seldom extending into the colder. Feeding on animal substances of all kinds, they render important service to the inhabitants of those countries, where putrefaction takes place with great rapidity, for which reason they are fostered in the neighbourhood of cities. Many of the larger species, however, capture their prey in the manner of Eagles and Hawks, although in general they are timid and comparatively inactive. Whether by smell or by sight, probably the latter, they descry their prey at a great distance. They soar to a vast height, sail in circles, and on ordinary occasions fly with moderate rapidity. The smaller species are gregarious, the larger solitary. They nestle on the ground, or in rocky places, forming a rude bed for their eggs, which vary from two to four. The young are at first covered with down, and remain in the nest until fully fledged, being at first fed with animal substances disgorged from the crops of their parents.

Vulturinæ.

Synopsis of the British Genera and Species.

Genus I. Vultur. Vulture.

Bill of moderate length, strong, deep; upper mandible covered as far as the middle with the cere, beyond which its dorsal outline is convexo-declinate, the sides rounded, the tip decurved, rather obtusely pointed; lower mandible with the rami slender, the tip obtuse; nostrils ~~oblong~~ transverse; feet strong; tarsus reticulate; ~~third~~ toes scutellate at the end, the third very long, connected at the base with the fourth; claws slightly curved; wings long and ample, the fourth quill longest; tail of moderate length, rounded, of fourteen feathers.

1. Vultur fulvus. Griffon vulture. Head and neck thickly covered with white down; plumage of upper parts light-reddish-brown; quills and tail-feathers blackish-brown.

Genus II. Neophron. Neophron.

Bill nearly as long as the head, straight, slender, slightly compressed; upper mandible covered to beyond the middle with the cere, its dorsal line slightly declinate, at the end decurved, the sides convex, the tip decurved and pointed; lower mandible with the rami slender, the tip obtuse; nostrils large, oblong, direct, medial; tarsus reticulate; toes scutellate at the end, the first very small, the third very

long, the anterior webbed at the base; claws rather long, arched, moderately compressed; wings very long, ample, the third quill longest; tail of moderate length, much rounded, of fourteen feathers.

1. Neophron Percnopterus. Egyptian Neophron.

Plumage white, excepting the primary quills and basal part of the secondaries, which are black.

Genus I. Vultur. Linn. Vulture.

The Vultures, properly so called, are birds of large size, and robust form, having the neck rather long, the head of moderate size, ovate, flattened above, anteriorly compressed.

Bill ~~rather~~ shorter than the head, stout, deep, straight, compressed toward the end; upper mandible covered to the middle with the cere, its dorsal line straight at first, beyond the cere convexo-declinate, the ridge rounded, the sides convex, the edges waved, toward the end sharp, the tip decurved, thin-edged, rather pointed; lower mandible with the crura slender, their interspace rather long, the dorsal line convex, the back rounded, the sides convex, the tip obtuse, with its edges thin and decurved. Nostrils large, lunulate, transverse. Eyes and aural apertures of moderate size. Feet rather short and stout; tarsus roundish, reticulated, ~~at the lower part scaled~~ ~~behind~~; toes scutellate, only at the end, the first small, the third much ~~longer~~ longer than the fourth, the anterior toes webbed at the base. Claws rather long, little-arched, strong, moderately compressed, blunted.

Head and great part of the neck without feathers, but densely covered with down; a large ruff of elongated feathers on the lower part of the neck; skin over the crop bare. Plumage full and dense. Wings ample, very long, convex; primaries decurvate, rather pointed, the fourth longest, the first short. Tail of moderate

length, rounded, of fourteen feathers.

This genus is composed of some of the largest vulturine species of the old continent:— birds of which the habits, however, have not been carefully studied, and respecting which the most contradictory statements have been made. They have been represented as lazy, slovenly, cowardly, filthy, gluttonous, ignoble in character and aspect, and have thus been held up to contempt. Others allege that they are little, if at all, inferior to Eagles in vigour and rapacity, although, from the form of their feet they are unable, like them, to carry off their prey. Feeding on carcases of all kinds, they help to prevent the formation of noxious vapours, and are thus truly useful to man, whereas the Aquiline and Falconine birds, which he so much admires, are in most cases mere pests

Briss.
1. Vultur fulvus. Linn. Griffon Vulture.

Bill pale yellow, cere dusky; feet greyish-blue; head and neck thickly covered with white down: on the lower part of the neck a ruff of the same; plumage yellowish-brown, paler on the lower parts: quills and tail-feathers blackish-brown.

Vultur fulvus. Briss.
Vautour griffon. Vultur fulvus. Temm. Man. I. 5.
Griffon vulture. Vultur fulvus. Bennet. Zoo. and Menag. of Zool. Soc. II. 97.
Vultur fulvus. Fulvous Vulture. Harvey. Fauna of Cork. 4.
Griffon vulture. Vultur fulvus. Thomp. Nat. Hist. of Ireland. I. 84.

Male.— This species presents all the characters indicated as belonging to the genus. It is of large size, measuring nearly four feet in length, and from eight to nine in extent of wings. The bill is of a dull pale yellow; the cere dark leaden-grey; the iris reddish-yellow; the feet greyish-blue. The down which covers the head and neck is white, as is that of the ruff. The feathers of the upper parts are light yellowish-brown, of the lower shade light reddish-brown; the quills and tail-feathers blackish-brown.

Female.— The female is larger, but similarly coloured.

Habits.— It is represented by authors as inhabiting various Egypt, Tangiers, Algeria, and other parts of Africa;

the Archipelago, Turkey, Silesia, the Tyrol, Italy, part of Spain, the Pyrenees, France and Germany. Nothing is stated of its habits generally, except that they are similar to those of other large vulturine species.

Mr. Yarrell informs us that, in the autumn of 1843, Admiral Bowles, then in command on the Cork station, saw at Castle Martyr, the seat of Lord Shannon, near the Cove of Cork, a vulture which had been caught by a youth on the rocks near Cork Harbour, in the spring of that year. Having been brought to Castle Martyr for sale, it was purchased by a domestic, for half-a-crown — a most wretched remuneration to the poor lad for the great trouble it must have cost him, independently of the value of the bird, which could not be less than Five Pounds. Mr. Thompson having been apprised of the capture, Mr. R. Ball wrote to Lord Shannon respecting it." His lordship politely offered the bird for the collection in the Garden of the Zoological Society, in Dublin, but it died before arrangements were completed for its transmission. By the direction of Lord Shannon, it was carefully stuffed, and then added to the collection in Trinity College, Dublin. It proved to be the Vultur fulvus in adult plumage, as distinguished from V. Kolbii, Daud." — Nat. Hist. of Ireland, vol. I. p. 84.

Savig.

Genus II. NEOPHRON. NEOPHRON.

Bill nearly as long as the head, straight, slender, slightly compressed; upper mandible covered to beyond the middle with the cere, its dorsal line slightly declinate, a little convex above the nostrils, at the end decurved, the ridge broad and convex, the sides convex, the edges straight, toward the end sharp, the tip decurved, thin-edged, and pointed; lower mandible with the angle long and narrowed, the dorsal line convex, the back rounded, the sides nearly erect, the tip obtuse, with its edge-line decurved.

Nostrils large, medial, oblong, nearer the ridge than the margin. Eyes and auditory apertures of moderate size. Feet rather short and stout; tarsus roundish, with small angular scales; toes scutellate only toward the end, being covered with transverse series of scales in the rest of their extent; the first toe very small, the third very long, the second shorter than the fourth; the anterior toes webbed at the base. Claws rather long, arched, strong, moderately compressed, blunted.

Fore part of head and throat without feathers, but having scattered over them very small downy or bristly plumelets. Plumage full and dense. Wings very long, ample, concave; primaries rather pointed, the third longest, the first short. Tail of moderate length, much rounded, of fourteen feathers.

This genus differs from Cathartes only in having the bill more slender, the third quill longest in place of the fourth and fifth, and the tail of fourteen instead of twelve feathers. Were it not for geographical considerations, these differences would not be of much importance. Neophron belongs to the Old Continent, Cathartes to the New.

I. NEOPHRON PERCNOPTERUS. THE ~~WHITE~~ NEOPHRON.

EGYPTIAN VULTURE. PHARAOH'S CHICKEN.



FIG. 210.

Vultur Percnopterus. Gmel. Syst. Nat. I. 249. Adult.
Vultur fuscus. Gmel. Syst. Nat. I. 248. Young.
Vultur Percnopterus. Lath. Ind. Orn. I. 2. Adult.
Vultur leucocephalus. Lath. Ind. Orn. I. 2. Adult.
Vultur fuscus. Lath. Ind. Orn. I. 5. Young.
Vultur ginginianus. Lath. Ind. Orn. I. 16. Adult.
Catharte alimoche. Cathartes Percnopterus. Temm. Man. d'Orn. I. 8; III. 6.
Egyptian Neophron. Neophron Percnopterus. Selb. Illustr. I. 4.
Neophron Percnopterus. Egyptian Neophron. Jen. Brit. Vert. An. 79.

Adult with the plumage white, excepting the primary quills and basal part of the secondaries, which are black. Young dark brown, spotted with brownish-yellow, subsequently of the latter colour.

MALE.—This Vulture, the smallest of the European species, is somewhat larger than the American Cathartes atratus or Black Vulture, which it greatly resembles in form. Its bill

is slender, and nearly of the same length as the head; the forehead, sides of the head, and a small portion of the throat are denuded and smooth; on the rest of the head and neck the feathers are lanceolate and acuminate, on the body ovate, obtuse, and compact. The wings are very large, and extend when closed nearly to the end of the tail, which is much rounded or graduated, and composed of fourteen feathers. The tarsi are of moderate length, reticulated with hexagonal scales; the hind toe short, with four scutella, the second shorter than the fourth, and having three scutella, the third very long, with four, the outer with six. The claws are moderate, compressed, arched, concave beneath, bluntly pointed.

The bill is dusky, toward the base flesh-coloured; the cere orange-yellow; the bare part of the face and throat pale yellow; the iris red; the feet greenish-yellow, the claws black. The plumage is yellowish-white, excepting the primary quills, and the basal portion, with a great part of the inner webs of the secondaries, which are black.

Length to end of tail 27 inches; bill along the ridge $2\frac{1}{2}$, along the edge of lower mandible $2\frac{4}{12}$; wing from flexure 18; tail 8; tarsus $3\frac{1}{4}$; hind toe $\frac{10}{12}$, its claw $\frac{6}{12}$; second toe $1\frac{8}{12}$, its claw $\frac{10}{12}$; middle toe 3, its claw $\frac{11}{12}$; outer toe $1\frac{10}{12}$, its claw $\frac{8}{12}$.

Female.—The female is similar to the male, but somewhat inferior in size.

Young.—In its first plumage, the young, according to M. Temminck, has the bare part of the head of a livid hue, and thinly covered with grey down; the cere and feet ash-grey; all the plumage of a dark brown colour, variegated with yellowish-brown spots; the quills black; the iris brown. Subsequently the plumage is of a lighter tint, and assumes its white colour in the third or fourth year.

Habits.—Very little is known respecting the habits of this bird, beyond what is common to it and most other vultures of small size. It appears to be generally distributed in Africa,

being found at the Cape of Good Hope, in Abyssinia, Egypt, and Barbary. In Asia it is also very extensively dispersed, having been met with in Arabia, India, and Persia. In Europe, it is abundant in Turkey, Spain, and Portugal, and occurs in the south of France; but beyond this to the northward its appearance is accidental. It is said to live in pairs, and to become temporarily gregarious only when attracted to a particular spot by the presence of food. Although it feeds chiefly on carrion, offal, and refuse, it attacks lizards, serpents, and small quadrupeds.

In October 1825, an individual was killed in Somersetshire, and was obtained by the Rev. A. Mathew, of Kilve, in that county, who lent it to Mr Selby, by whom it has been figured and described in his Illustrations. "When first discovered, it was feeding upon the carcase of a dead sheep, and had so gorged itself with the carrion as to be unable or unwilling to fly to any great distance at a time: it was therefore approached without much difficulty and shot. Another bird, apparently of this species, was seen in the neighbourhood a few days, but could never be approached within gunshot: this was supposed to be the mate of the one killed. It measured two feet seven inches in length, and in extent of wing five feet nine inches. Its bill from the forehead to the tip is two inches and a half long, the tarsus three inches, and the middle toe with its claw the same. The bill is brownish-black or horn-coloured. The cere, which is somewhat bulging at the base, and occupies half the length of the bill, wine-yellow. Nostrils situated on the middle of the cere, large and open. Crown of head, cheeks and throat, covered with a naked skin, of a livid flesh-coloured red, with a few straggling bristly feathers between the bill and eyes, and upon the margins of the mandibles. Ears round, open, and large. Occiput and nape covered with a close thick-set white down, with small black feathers intermixed. Neck clothed with long arched and acuminated feathers, forming a kind of ruff of a deep umber brown, tipped with cream-yellow. Back and scapulars cream-white, the latter intermixed and varied with umber-brown. Lesser wing-coverts nearest the body deep umber-brown, margined with a paler shade: these are succeeded by

two rows of cream-coloured sharp-pointed feathers. Greater coverts umber-brown, varied with cream-white. Secondaries pale umber-brown, their tips and margins yellowish-white. Quills black. Tail cuneiform, umber-brown at the base, the tip yellowish-white. Upper parts mixed with umber-brown. Legs strong and fleshy, of a pale yellowish-grey. The tarsi covered with a rough reticulated skin: the middle toe with four entire scales upon the last phalange; the exterior and interior each with three; hinder toe short and strong. Claws blackish-brown, strong, but not greatly arched. Its sex unfortunately was not ascertained. From the above description it would appear that this individual had not acquired its mature plumage, which, in the perfect adult, is of an uniform white, except the greater quills, which are black, and in which state it is recognised as the Vultur ginginianus of Latham and other authors."

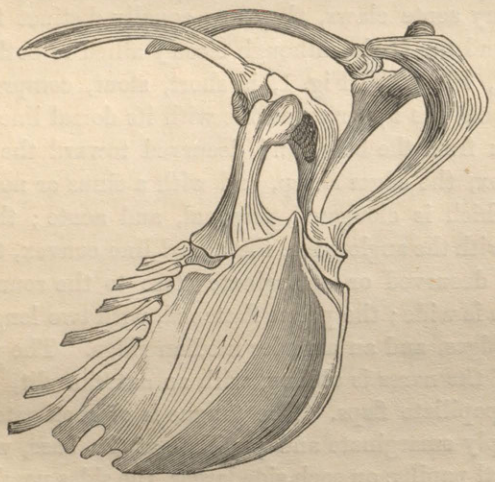


Fig. 211.

FALCONINÆ.

~~THE BIRDS.~~
~~FALCONS AND ALLIED SPECIES.~~

Assuming the Falcons properly so called as presenting the more distinctive characters of the great family composed of the birds commonly known as Eagles, Hawks, Buzzards, and Kites, we may designate these species by the general name of Falconinæ. Although they exhibit numerous and well-marked modifications of the various organs, they are easily defined as a group, and individually distinguished from all other birds. Of compact form, with a rather large, roundish, feathered head, hooked bill, eyes of moderate size directed laterally, and long, curved, very acute claws, they are equally distinct from the Vultures and the Owls, although closely allied to both.

The bill, Plate IV, Fig. 1, is short, stout, compressed toward the end, the upper mandible with its dorsal line more or less convex from the base, and decurved toward the end, its sides convex, the edges sharp, and with a sinus or notch near the tip, which is elongated, trigonal, and acute; the lower mandible with the angle wide, the dorsal line convex, the edges sharp and decurved or emarginate close to the rounded tip. The mouth is wide; the palate flattened, with two longitudinal papillate ridges, and an anterior median ridge. The posterior aperture of the nares is oblong, with an anterior slit, and two transverse papillate flaps. The tongue is of moderate length, fleshy, deeply emarginate and papillate at the base, with one of the lateral papillæ on each side larger, the sides nearly parallel, the tip rounded and horny beneath. The œsophagus is very wide, and about the middle of the neck is dilated into a large sac or crop lying towards the right side, the trachea passing along the other. At its upper part, it has a layer of inconspicuous longitudinal muscular fibres, and in its whole

Falconine Birds.

length a distinct coat of transverse fibres, while the inner coat is smooth, but, when the organ is empty, arranges itself into longitudinal folds. The proventricular glands, which are small and very numerous, form a broad belt. The stomach is large or of moderate size, roundish, with its muscular coat thin and composed of a single series of fasciculi, converging toward two thin circular tendinous spaces; its inner coat or epithelium soft, dense, and more or less rugous. The intestine is generally rather short and of considerable width, but sometimes very long and extremely narrow; the cœca are always extremely small, and the rectum has a very large globular dilatation or cloaca.

The trachea differs from that of the Vultures in having a pair of inferior laryngeal muscles, and a septum in the last entire ring. Its structure will be best understood by referring to Plate XIX, of which Fig. 2 represents, *a*, the tongue, *b*, its basal portion, covered with apertures of mucous crypts; *c*, aperture of the glottis; *d e*, the trachea, flattened, tapering, and composed of sixty-six rings, of which one at the bifurcation, when taken out and viewed from beneath, is seen to have a median septum, Fig. 3, or in other words, to be composed of two united rings. Beyond it are two half rings, Fig. 1, *f f*. The bronchi, *g h*, *g h*, are composed of about sixteen half rings. The lateral muscles, *i j*, *i j*, are strong, and terminate partly, as usual, in the sterno-tracheales, *j k*, *j k*, and partly in a single pair of inferior laryngeal muscles, *j f*, *j f*, inserted into the membrane interposed between the last ring of the trachea and the first of the bronchi. This muscle is better seen in the lateral view, Fig. 4; and the septum of divarication in Fig. 5, which represents a median longitudinal section. Fig. 6 also shews the inferior laryngeal muscles separated. Fig. 7 represents the anterior aspect of the upper larynx, in which are seen the two hyo-thyroid muscles, *a a*; the thyroid bone, *b b*; and the commencement of the contractor muscles, *c c*. Fig. 8 shews the upper larynx viewed from behind, with the apertor muscle, and the constrictor, *b*.

The eyes are always large, lateral, but more or less inclined forwards; both eyelids equally mobile. Nostrils small or of

moderate size, varying from circular to linear, and opening near the anterior margin of the cere. The aperture of the ear is round or elliptical, and rather large.

The legs are of moderate length or elongated; the tibia very muscular; the tarsus sometimes feathered, generally bare, usually scutellate in front and behind, sometimes scaly all round. The toes are four; the first large and stout, the third longest, the second larger than the fourth; the anterior somewhat webbed at the base; all scutellate toward the end, sometimes in their whole length, padded and tuberculate or papillate beneath. The claws are long, moderately compressed, tapering, very acute, and with a great range of motion, although not retractile, as usually alleged.

The plumage is generally full; the feathers compact on the upper parts, those on the outer side of the tibia elongated; but great variations are observed in their form and texture. The skin is entirely covered with soft down, which on the fore part of the breast, on the sides under the wings, and on part of the abdomen, is usually not intermixed with feathers, although more or less covered by them. Individually the feathers are very downy at the base, with a large plumule; the tube is short, but enlarged, the shaft slender.

The wings are of great size, but vary in form, being very long or of moderate length, pointed or rounded. The tail, which is always of twelve feathers, is never small, but varies extremely in length and form, being even, graduated, emarginate, or forked.

The cranium, Pl. I, is generally roundish, with the orbits extremely large, their septum with a vacuity in the centre; the nasal cavity rather large; a distinct superciliary bone projecting from the edge of the orbit; the jaws short. The vertebræ vary in number, but are generally thus: twelve cervical, nine dorsal, twelve sacral, eight caudal. The ribs, seven in number, are rather stout; the pelvis large. The sternum is usually of great size, deeply convex, with a very prominent keel, the posterior margin even, the coracoid bones very large and spreading, the furcula very wide and of great strength; the scapulæ of moderate size and slightly curved. The bones of the inferior extre-

mities vary in length and thickness according to the species. The phalanges of the toes are, as usual, two, three, four, and five.

The Falconinæ prey on quadrupeds, birds, reptiles, fishes, and insects, which they pursue by flying, not by walking. Indeed most of the species, owing to the form of their feet, are incapable of progression on the ground, and when they have to move to short distances, are obliged to leap, with the aid of their wings. They seize their victims with their talons, thrust into them their long acuminate claws, and, when of sufficiently small size, carry them off to some secure retreat. The bill is not generally used for inflicting wounds, but with it they remove the hair or feathers, previously to eating the flesh, which they tear up with ease, often swallowing the bones. Having filled the œsophagus, which is always capable of being much dilated, they retire to some sequestered place, and remain quiet until the food is digested. The insoluble parts are vomited in roundish pellets, in which the bones are enveloped by the hair and feathers. Their sight is very acute, as is their sense of hearing. Their flight presents modifications, according to the species, being strong and rapid in the Falcons, more buoyant in the Harriers, light and gliding in the Hawks, heavier in the Buzzards and Eagles; but in all it is remarkably powerful. They perch with ease, and when at rest on a branch or pinnacle, keep the body nearly erect, and the neck much retracted. On a level surface, they incline the body forward, and draw up their claws.

These birds are for the most part solitary, and although some species at times congregate when food is abundant, none of those that occur in Britain are gregarious in the slightest degree. Their cries are loud and shrill, with little modulation; their trachea being of nearly uniform width, its rings generally cartilaginous, and the inferior laryngeal muscles reduced to a single pair. They pair early in spring, and form a rude flat nest of sticks, twigs, and other materials, lined with wool or hair, the eggs vary from two to seven or eight, the larger species having fewer than the smaller, and are of a roundish or elliptical form. The young are at first clothed with light-coloured down, and remain in the nest until fully fledged, when they

differ considerably in colour from their parents, it not being until the third or fourth year that the adult plumage is complete. When the old birds have transverse bands, the young generally have longitudinal spots; in many species, the spots and streaks of the young disappear with age; the tints usually become purer and lighter the older the individual; and on the other hand many which are patched or spotted with white when young, gradually assume a darker tint. In consequence of these variations, great errors have been committed in naming and distinguishing the species. The moult commences in the end of summer, and is completed by the beginning of winter; but in some species, the Eagles in particular, new feathers are found at all seasons.

The males are always much smaller than the females. When the sexes differ in colour, the young resemble the female, which is generally darker and more variegated than the male.

Of the ~~nineteen~~ twenty species that occur in Britain, some, as the Kestrel, Sparrow Hawk, and Hen-harrier, are generally distributed, while others, as the Eagles, are confined to the northern and more mountainous tracts, and several, as the Honey Buzzard and Red-legged Falcon, are rare or irregular visitants.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. BUTEO. BUZZARD.

Bill short, compressed toward the end, with the upper outline sloping a little to the edge of the cere, then decurved, the sides rapidly sloping, the edges with a distinct rounded festoon; nostrils elliptical, oblique; head large, broad, flattened; feet short, robust; tarsus roundish, feathered in front halfway down, anteriorly and posteriorly scutellate, or feathered in its whole length; wings long, broad, rounded, the fourth quill longest, the outer four with the inner web abruptly narrowed.

2 1. *Buteo* ~~*fuscus*~~ *vulgaris*. ~~*Brown*~~ *Buzzard*. Tarsus bare; upper parts chocolate-brown, lower variegated with white; tail barred with dusky and greyish-brown. Common

~~2~~. *Buteo lagopus. Rough-legged Buzzard.* Tarsus feathered; upper parts brown, variegated with yellowish; lower yellowish, with a large brown patch on the breast; tail white to beyond the middle, the rest brown.

GENUS III. AQUILA. EAGLE.

Bill shorter than the head, very deep, compressed; its upper outline nearly straight and sloping to the edge of the cere, then decurved, the sides slightly convex, the edges nearly straight, with a slight festoon; nostrils oval, oblique, head large, roundish, flattened above; feet rather short, very robust; tarsus roundish, feathered to the toes; wings long, the fourth quill longest.

1. *Aquila Chrysaëtus. Golden Eagle.* Plumage dark-brown; occiput and hind-part and sides of neck and legs light brownish-yellow; wing-coverts light brown; tail dark brown. Young with the basal three-fourths of the tail white.

2. *Aquila navia. Spotted Eagle.*

GENUS IV. HALIAETUS. SEA-EAGLE.

Bill nearly as long as the head, very deep, compressed, with its upper outline nearly straight to beyond the cere, then decurved, the sides sloping and slightly convex, the edges nearly straight, with a slight festoon; nostrils oblong, oblique; head large, oblong, flattened; feet rather short, very robust; tarsi roundish, bare for two-thirds, scaly, with about six scutella in front; claws large, curved, flat beneath; wings long, the third quill longest.

1. *Haliaëtus Albicilla. White-tailed Sea-Eagle.* Adult with the head and neck light brownish-grey; the tail pure white. Young with the head and neck dark-brown, streaked with paler, the tail brownish-black, irregularly varied with white.

GENUS V. PANDION. OSPREY.

Bill short, as broad as deep at the base, its upper outline straight to the edge of the cere, then decurved, the sides con-

vex, the edge with a slight festoon; nostrils oblong, oblique, large; head of moderate size, ovate; legs with the feathers short, tarsus very short, remarkably thick, covered all round with scales; toes very thick, with conical papillæ beneath, the outer versatile; claws long, curved, convex beneath; wings extremely long, and rather narrow.

1. *Pandion Haliaëtus.* *Fishing Osprey.* Brown above, white beneath, with a brown patch on the breast. Young with the feathers tipped with white.

GENUS V. PERNIS. ~~BEE-HAWK~~. Pern

Bill short, rather small, compressed toward the end, its upper outline gently curved from the base, the edge with a very slight festoon; nostrils large, oblong, oblique; head of moderate size, ovate; feet short and strong; tarsus short, roundish, feathered anteriorly for half their length, covered all round with hexagonal scales; claws long, little curved, slender, concave beneath; space before the eyes covered with very small compact feathers; wings and tail very long.

Honey Pern 1. *Pernis apivora.* ~~*Brown Bee-Hawk.*~~ Umber-brown above.

GENUS VI. MILVUS. KITE.

Bill short, stout, compressed toward the end, its upper outline convex and sloping to the edge of the cere, then decurved, the sides convex, the edge with a distinct festoon; nostrils elliptical, oblique; head large, ovate; legs very short, strong; tarsus roundish, feathered for half their length; wings very long, the fourth quill longest; tail very long, forked.

Common 1. *Milvus regalis.* ~~*Salmon-tailed Kite.*~~ Reddish-brown above, with narrow dusky streaks, lower parts of a lighter tint.

GENUS VII. NAUCLERUS. ~~SWALLOW-KITE~~. forked Nauclerus.

Bill short, wide at the base, much compressed toward the end, its upper outline decurved from the base, the sides slightly convex, the edge with a slight festoon; nostrils round, with a

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central papilla; head rather large, roundish, flattened; feet short; tarsus very short, thick, scaly all round; toes with pointed papillæ beneath; wings extremely long, pointed, with the third quill longest; tail long, and very deeply forked.

1. *Nauclerus furcatus. White-headed Swallow-Kite.* Head, neck, and lower parts white; back, wings, and tail black.

GENUS VIII. FALCO. FALCON.

Bill short, robust, with the upper outline decurved from the base, the sides very convex, the edge with a festoon and a prominent angular process; nostrils round, with a central tubercle; head large, roundish; feet strong; tarsi moderate, reticulate; claws long, well-curved; wings long and pointed, the second quill longest; tail rather long, nearly even.

Gyrfalco 1. *Falco ~~islandicus~~. Gyr Falcon.* White, spotted with dusky. Young brownish-grey or light grey above, beneath yellowish-white, with longitudinal dusky streaks.

2. *Falco peregrinus. Peregrine Falcon.* Wings nearly as long as the tail. Adult greyish-blue above, beneath whitish, with transverse dusky spots; head and a band on the cheek black. Young blackish-brown above, beneath reddish, with longitudinal dusky spots.

3. *Falco Subbuteo. Hobby Falcon.* Wings longer than the tail. Adult greyish or brownish-black above, whitish beneath, longitudinally spotted with dusky; a black band on the cheek.

4. *Falco vespertinus. ~~Orange-legged~~ Falcon.* Wings as long as the tail. Male deep bluish-grey, with the abdomen and legs yellowish-red. Female with the crown yellowish-red, the back greyish-blue, the tail grey, both barred with black. Red-footed

5. *Falco Æsalon. Merlin Falcon.* Wings shorter than the tail. Male greyish-blue above, with dusky lines, reddish-yellow, with oblong dusky spots beneath. Female greyish-brown above, yellowish-white, with large dusky spots beneath. Young with the upper parts brown, spotted with light red.

6. *Falco Tinnunculus. Kestrel Falcon.* Wings shorter than the tail. Male light red, spotted with black above; the head, hind-neck, rump, and tail bluish-grey. Female and young

with the upper parts and tail light-red, spotted and barred with black.

GENUS IX. ACCIPITER. HAWK.

Bill short, ~~robust~~, with the upper outline sloping and ~~nearly straight~~ to the edge of the cere, then decurved, its sides convex, the edges with a prominent festoon; nostrils elliptical, very oblique; head of moderate size, roundish; feet of moderate length; tarsi ~~moderate or~~ rather long, slender, feathered for at least a third, broadly scutellate before and behind; claws long, well-curved; wings of moderate length, very broad, much rounded, the fourth and fifth quills longest; tail long, rounded, much exceeding the wings.

1. *~~Accipiter~~ Palumbarius. Goshawk.* Male dark bluish-grey above, with the head greyish-black, the lower parts white, narrowly barred with grey. Female greyish-brown above, beneath like the male. Young brown above, with the head and neck pale red, streaked with dusky, the lower parts yellowish-white, with longitudinal dusky spots.

~~2.~~ *Accipiter Nisus. Sparrow Hawk.* Male dark bluish-grey above, reddish-white, with transverse bars of yellowish-red beneath. Female greyish-brown above, beneath greyish-white, barred with dark-grey.

GENUS X. CIRCUS. HARRIER.

Bill short, compressed, attenuated, with the dorsal line sloping to beyond the cere, then decurved, the sides sloping, the edge with a slight festoon; nostrils large, ovato-oblong, with an oblique ridge; head oblong, of moderate size; legs long, slender; tarsi long, compressed, scutellate before and behind; claws long, slender, moderately curved, flat beneath; plumage very soft; a distinct ruff from behind the eye to the chin; wings long, much rounded, the fourth quill longest; tail long, slightly rounded; quills and tail-feathers downy as in owls.

~~1.~~ *Circus cyaneus. Ring-tailed Harrier.* Tail about two inches longer than the wings. Male light bluish-grey. Female brown above, light yellowish-red with brown streaks beneath.

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Ash-coloured or

3 ~~2.~~ *Circus cinereaceus.* *Montagu's Harrier.* Wings as long as the tail. Male light bluish-grey, the wings with a black band. Female umber-brown above, pale-red beneath.

1. ~~3.~~ *Circus æruginosus.* ~~*Brown*~~ *Harrier.* Dark umber or chocolate, with the head whitish or yellowish. Moor

Of the species here enumerated two are common and generally distributed: the Sparrow Hawk and the Kestrel. Two, less common, are extensively dispersed: the Common Buzzard, and the ~~Common~~ Harrier. Some are common in particular districts, but not of general occurrence: the Merlin, which in many parts of Scotland and the north of England is nearly as plentiful as the Sparrow Hawk, the Kite, which is not rare in the West Highlands, the Sea-Eagle, which is still numerous in the Hebrides, and along the north-west coast, and the Golden Eagle, which is scattered over a great part of the northern and middle divisions. Of the rest, the Osprey, although very scarce is extensively distributed, the Goshawk is so rare that a native specimen is hardly to be seen in our museums, the Ash-coloured Harrier is confined chiefly to the south and east of England, the Moor Harrier is very scarce anywhere, as is the Hobby, while the Peregrine Falcon is seen in pairs scattered at wide intervals, and the Jer Falcon is ~~confined to the extreme north~~. The Honey ~~Buzzard~~ occurs as a straggler, which is also the case with ~~the Rough-legged Buzzard~~, the ~~Orange-legged~~ Red-footed Falcon, and still more with the Fork-tailed Kite, of which only ~~two~~ individuals are recorded as having been seen. Ring-Tail Perm. of extremely rare occurrence.

The Rough-legged Buzzard appear along our eastern coasts in the end of autumn, and ~~appear~~ remain with us during the winter and spring, some individuals, however, having been known to breed and pass the summer also in England.

Genus IX. Astur. Goshawk.

Bill short, robust, with the outline sloping and nearly straight to the edge of the cere, then decurved, its sides convex, the edges with a prominent festoon; nostrils elliptical, oblique; head of moderate size, roundish; feet of moderate length; tarsi rather slender, feathered for at least a third, broadly scutellate before and behind; claws long, well-curved; wings of moderate length, very broad, much rounded, the fourth and fifth quills longest; tail long, rounded, much exceeding the wings.

1. Astur palumbarius.

Bechst.

Genus IV. BUTEO. BUZZARD.

This genus is composed of species for the most part of large size, or from fifteen to twenty-five inches in length, and having an obvious affinity on the one hand to certain species of the genus ~~Accipiter~~ Astur, and on the other to the smaller Eagles. Between the Buzzards and the latter birds there is in truth no well-marked distinction, and the Rough-legged Falcon, so called, is, I think, exactly intermediate between the two genera. The Buzzards are not remarkable for elegance of form, or for courage and activity. They are generally robust, having the body full and compact, the neck rather short, the head large, roundish, and flattened above.

The bill shorter than the head, moderately stout, broad at the base, compressed toward the end; upper mandible with the cere of moderate size, the dorsal line slightly convex and considerably declinate to the edge of the cere, then decurved in the fourth of a circle, the ridge broad and somewhat flattened at the base, narrowed and convex toward the end, the sides rapidly sloping and slightly convex, the edges with a slight sharp-edged rounded festoon, succeeded by a shallow sinus ending in the curve of the tip, which is deflected, trigonal, slightly concave beneath, acute, and at the end nearly perpendicular; lower mandible with the angle of moderate length, wide, the dorsal line slightly convex, the ridge broadly convex, the sides rounded, the edges a little inflected, at the end decurved, the tip broad and rounded.

Mouth wide; palate flat anteriorly, having a broad soft ridge, from the posterior part of which proceed backwards two very prominent, nearly parallel, soft ridges, bearing small pointed papillæ. Between these ridges is a depression which corresponds to the tongue. A transverse papillate edge proceeds inwards from the middle of these ridges, and they ter-

minate in a similar curved edge behind. Posterior aperture of the nares narrow-elliptical behind, linear before, with papillate margins. Tongue short, fleshy, rather narrow, concave above; its sides nearly parallel, the tip rounded and emarginate, its free part beneath horny; the lower surface of the sides toward the base furnished with large mucous crypts; the base concave, and fringed with pointed papillæ directed backwards. Space between the base of the tongue and the aperture of the glottis covered with mucous crypts, of which there is also a lateral series on each side; the posterior part of the pharynx supplied with similar bodies irregularly disposed. Aperture of the glottis defended behind by a number of papillæ directed backwards, and arranged in two lateral lobes, with a small intermediate lobe. Œsophagus very wide, and about the middle of the neck dilated into a large sac or crop, inclining to the right side. At the upper part it has a slight outer layer of inconspicuous longitudinal muscular fibres, and in its whole length is encircled by transverse fibres; its inner coat is smooth and even when dilated, but when contracted is thrown into longitudinal rugæ. At the lower part is a broad belt of cylindrical crypts, constituting the proventricular glands. The stomach is large, round, a little compressed; its muscular coat thin, and composed of a single series of fasciculi converging toward two roundish thin tendinous spaces; the inner coat smooth and very thin. The pylorus with three or four prominent rugæ. The intestine of moderate length, rather wide; the cœca very small; the rectum wide, and dilated into a globular cloaca.

Nostrils broadly elliptical, oblique, lateral, nearer the ridge than the edge. Eyes large; eyelids fringed with bristly feathers; a thin projecting superciliary ridge. Aperture of the ear roundish, and rather large.

Legs of moderate length, stout; tibia rather long and muscular; tarsus roundish, feathered anteriorly for half its length, with broad scutella before and behind, scaly on the sides. Toes of moderate size; the first and second stoutest, the latter a little longer, the third much longer, the fourth longer than the second, and connected at the base by a pretty large web; all scutellate

unless toward the base. Claws long, well curved, tapering, very acute, convex above, compressed, flat beneath; the first and second largest, the fourth small, the third internally edged.

Plumage full, very soft and elastic, but somewhat compact, and rather glossy. Cere bare; space between the eyes and bill with radiating, very small, bristled-tipped feathers, with downy barbs at the base. Feathers of the head narrow and pointed, of the neck broader, of the other parts broadly ovate and rounded. Wings long, very broad, rounded; the third and fourth quills longest, the first very short, the outer four with the outer web attenuated, and the inner abruptly cut out; secondary quills very broad and rounded. Tail of moderate length, or rather long, broad, rounded, of twelve broad feathers.

The Buzzards are considered as among the least active birds of this family; yet their flight is strong and buoyant, very similar in character to that of the Eagles, which they resemble in form, although many of them are very intimately allied to some species of the genus ~~Accipiter~~ Astur, while others approximate to the Circi. They sail in circles like the Eagles, mounting to a great height, seek out their prey by flying low over the fields, seldom pursue birds on wing, but pounce upon them on the ground, and, besides these animals, feed on small quadrupeds, reptiles, insects, and worms. Species of this genus are found on both continents. In Britain two are met with, ~~the Common or Brown Buzzard, and~~ the Rough-legged Buzzard, distinguished by having its tarsi feathered, and the Common Buzzard.

2. BUTEO ~~FUSCUS~~ *vulgaris*. THE ~~BROWN OR~~ COMMON BUZZARD.

GLEAD. GLADE. KITE. PUTTOCK.

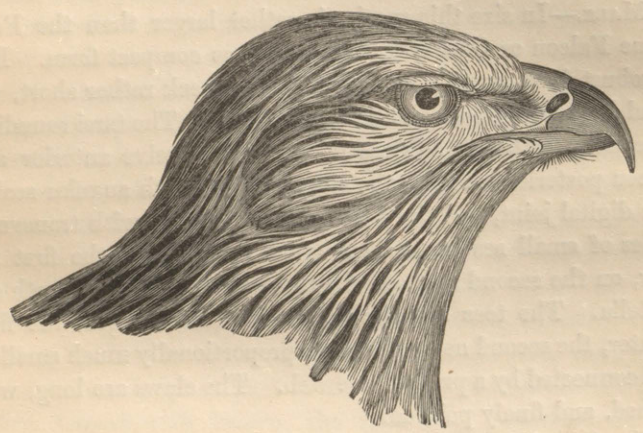


Fig. 212.

Falco Buteo. Linn. Syst. Nat. I. 127.
Falco Buteo. Lath. Ind. Orn. I. 23.
Buzzard. Mont. Orn. Dict.
La Buse. Falco Buteo. Temm. Man. d'Orn. I. 63; III. 35.
Common Buzzard. Buteo vulgaris. Selb. Illustr. I. 55.
Buteo vulgaris. Common Buzzard. Jen. Brit. Vert. An. 87.

Male with the upper parts deep brown, the feathers margined with paler, the lower parts yellowish-white, with longitudinal oblong brown spots, the tail with numerous brown and pale bands. Female deep brown above and beneath, the throat streaked with whitish, the breast spotted with the same. Young with the feathers margined with light red.

The Buzzard, although the most common of our larger Plunderers, has been very unsatisfactorily described by authors, most

of whom merely state that it varies exceedingly in colour, insomuch that two similar individuals can hardly be found, without attempting to disclose the cause or method of this variation. I cannot say that I have completely solved the mystery; but the following descriptions will, I hope, be found to throw considerable light on the subject. I shall begin with a pair, an adult male and female shot in Ayrshire in May 1837.

Male.—In size this species is rather larger than the Peregrine Falcon or Goshawk, but of a less compact form. It is a robust bird, with the body full, the neck rather short, the head large, roundish, and flattened above. The tarsi roundish, anteriorly feathered halfway down, with twelve anterior and fifteen posterior scutella, the sides covered with angular scales, the digital joint, and the basal part of the toes with transverse series of small scales, besides which there are on the first toe four, on the second five, on the third eleven, on the fourth six scutella. The toes are strong, of moderate length, the first stouter, the second next, the outer proportionally much smaller, and connected by a pretty large web. The claws are long, well arched, and finely pointed.

The digestive organs being in all respects as described in the generic character, it may suffice here to state that the œsophagus is six inches long, the crop three inches wide; the stomach two inches in diameter; the intestine four feet four inches in length, with a diameter varying from five and a half twelfths to two and a half twelfths; the cœca three twelfths long; the rectum five.

The plumage is full and soft, rather compact and glossy above; the upper and fore part of the cere is bare, the space between the bill and eye covered with bristly feathers, which are slightly downy at the base; the superciliary ridge bare, the eyelids ciliated. On the head the feathers are small and lanceolate, on the neck larger, broader, and more rounded, on the back broadly ovate, on the lower parts ovato-oblong, on the outer part of the leg elongated. The wings are large and rounded, with twenty-five quills, the first four primaries abruptly cut out on the inner web, the first six attenuated on the outer;

the first quill four inches shorter than the third, which is longest, but exceeds the fourth only by one-twelfth of an inch, the fifth very little shorter, the second intermediate between the fifth and sixth, the first equal to the eighth. The tail is rather long, broad, and slightly rounded, the middle feathers being about three quarters of an inch shorter than the lateral.

The bill is black, at the base greyish-blue, its soft margins at the base yellow; the cere and bare space over the eye greenish-yellow; the irides brownish-yellow; the feet bright yellow; the claws black, tinged with blue at the base. The general colour of the upper parts is umber-brown, glossed with a tinge of purple; but on the head and hind neck streaked with yellowish-white, the bases and margins of the feathers being of that colour. The feathers of the back and wings with the margins pale, or brownish grey; they and the scapulars barred with white in their concealed part; the bases of all being white, which becomes apparent on the hind-neck when they are raised; the upper tail-coverts are barred with whitish. The primary quills are brownish-black toward the end, the secondaries brown, a great part of the inner webs toward the base white, barred with brown, the bars more extended on the secondaries. The tail is marked with ten or twelve brown bars, alternating with others of a pale greyish-brown, the tips whitish. The cheeks and sides of the neck are yellowish-white, with brown linear or oblong markings; the throat, fore-neck, and middle of the breast yellowish-white, with the shafts brown; the ground colour of the other parts the same, but each feather with an oblong brown longitudinal mark; the lower tail-coverts barred; the feathers of the leg tinged with reddish, and barred or patched with brown. The lower wing-coverts yellowish-white, spotted and barred with brown; and the white of the inner webs of the primaries forming a conspicuous patch.

Length to end of tail 19½ inches; extent of wings 49; wing from flexure 16½; tail 9; bill along the ridge $1\frac{7}{12}$, along the edge of lower mandible $1\frac{6}{12}$; tarsus $2\frac{10}{12}$; hind toe $\frac{9}{12}$, its claw 1; second toe 1, its claw $1\frac{1}{12}$; third toe $1\frac{6}{12}$, its claw $\frac{10}{12}$; fourth toe 1, its claw $\frac{7}{12}$.

Female.—The female is considerably larger than the male, and although similar in colouring differs in several respects. The colours of the bill, iris, and feet are the same as in the male. The upper parts are of a darker and more uniform brown, the bases of the feathers dull grey, and only white on the hind-neck; the whitish bands on the scapulars more obscure. The wings and tail are coloured as in the male, only the last brown bar on the latter is much broader than the rest. The predominant colour of the lower parts is chocolate-brown; but the cheeks and throat are streaked with dull brownish-white; the fore-neck obscurely, the middle of the breast conspicuously transversely spotted or barred with yellowish-white, intermixed with reddish; the inner and anterior feathers of the legs barred with brownish-red; the lower tail-coverts white barred with brown; the lower surface of the wing as in the male but much darker, the white patch consequently more conspicuous.

Length to end of tail 22 inches; extent of wings 51; wing from flexure 17; tail $9\frac{3}{4}$; bill along the ridge $1\frac{7}{12}$; tarsus 3; first toe 1, its claw $1\frac{1}{4}$; second toe $\frac{11\frac{1}{2}}{12}$, its claw $1\frac{1}{4}$; third toe $1\frac{1}{2}$, its claw $1\frac{1}{12}$; fourth toe $1\frac{1}{12}$, its claw $\frac{10}{12}$.

Another individual shot in Aberdeenshire, in May 1817, was similar to the above; the whole upper surface rich brown, on the upper part of the back the feathers laterally margined with light ferruginous, the scapulars and wing-coverts with that colour and white; the primary quills nearly black, glossed with purple toward the end; the secondaries nearly of the general tint; all with the inner webs edged with white, and barred with a deeper shade of brown; on its lower surface, the wing much lighter, there being a white patch including part of the inner webs of the five outer quills; the coverts barred with white, their ground colour being toward the base light ferruginous, toward the end deep brown; the tail deep brown, barred with grey and reddish, or marked with alternate bars of brown and brownish-grey, the last dark bar being the broadest, and the tips reddish-white; nine dark bars on the middle, and ten on the lateral feathers; on the lower surface the prevailing colour brown, of a lighter shade than

the upper; on the fore-neck spotted, on the breast barred with white; the tibial feathers brown, tipped with ferruginous.

Length 21½ inches; extent of wings 50.

These differences between the adult male and the adult female I have found to be very constant, although individuals of each sex vary considerably.

Variations.—Males vary in having the white of the lower parts more or less extended, and the streaks and spots of greater or less breadth. Sometimes the white is so extended on both surfaces that it might be said to form the ground colour, which is then merely spotted with brown. Females differ also in the extent of the white spots and bars beneath, but they are always darker and more uniformly coloured than the males. Great differences are observed in the number of the scutella, and I have seen a male, which had none on the fore part of the tibia, it having been covered with small scales.

The following tables shew the variations in the scutella and digestive organs.

	M.	M.	M.	M.	F.	F.	F.
Scutella of tarsus	11	12	13	11	14	12	10
First toe	4	4	3	3	4	4	4
Second toe	4	4	4	5	4	4	4
Third toe	10	11	11	14	12	14	13
Fourth toe	5	4	6	8	7	7	6

	M.	M.	F.	F.	F.	F.
Œsophagus in length,	7½	6	8	6	8	8
Crop in width	2½	3	2		3	8
Stomach	3	2	2		3	3
Intestine	51	52	56	52	54	55
Cœca	$\frac{3}{12}$	$\frac{3}{12}$	$\frac{2}{12}$		$\frac{3}{12}$	$\frac{3}{12}$

Changes of Plumage.—The moult sometimes commences very early, so that even by the middle of May I have seen it far advanced; but in general it is not completed until the beginning of winter. When the feathers are old they become very ragged and pointed, change from deep glossy brown to

greyish-brown, with the edges yellowish or even whitish-brown; so that individuals in this state seem very different from those of which the plumage is fresh, and in those which are moulting the contrast between the old and new feathers is very conspicuous.

Habits.—The Buzzard is generally distributed in Britain, in the southern parts inhabiting the wooded tracts, and in the northern preferring the wilder and more hilly districts. Its food, as disclosed by the substances which I have found in its œsophagus and stomach, consists of small quadrupeds, the mole, short-tailed and long-tailed field mice, shrews, young birds, the red grouse, the ~~grey~~ common partridge, various small birds, lizards especially aquatic species, beetles, larvæ, and not unfrequently large earthworms. In one instance I found the stomach filled with the latter; and in another, with leaves of plants and roots, along with beetles and an earthworm. The mole, large as it is, I have sometimes found swallowed entire, and animals of smaller size it seldom tears to pieces.

When searching for food, the Buzzard flies low over the ground, advancing quietly with an equable and moderately buoyant flight, and occasionally wheeling to either side. It seldom pursues a bird on wing, but prefers pouncing on its prey as it reposes or cowers on the ground, and it is said sometimes to devour carrion. When merely proceeding from one place to another, it flies in a direct course, and with great speed, shooting along at times without apparently moving its wings, in the manner of the Eagles; and although it cannot in this respect be compared with the Sparrow Hawk or the Peregrine Falcon, it by no means deserves the opprobrious epithets of lazy and sluggish and indolent which have been conferred upon it. At times, whether for amusement or gentle exercise, it gradually ascends in the air to a great height, and sails along in a circling manner with widely extended wings. When thus engaged it so much resembles an eagle that the observer, not being able to calculate its distance with certainty, might mistake it for such, although the large white patch on the lower surface of the wing, which is very conspicuous, suffices to distinguish the bird.

I Mr. Thompson, in his "Natural History of Ireland", vol. I. p. 74, relates that a tame Buzzard "regularly attended the potato-diggers to feed on the worms exposed to view, to which it was so partial, that they were sought for at times to give to it as food." This diet, however, is not peculiar to the Buzzard. Mr. St. John states of a captive Merlin that "when hungry and no other food was to be had, he would attend the gardens when digging, and swallow the large earthworms as they were turned up!"

The history of the Buzzard is less remarkable than that of many other birds of this family, and as it is not apt to attract attention, little can be said of it. After procuring a sufficiency of food, it retires to some large tree in a secluded place, or to the ledge of some rock, and there reposes until digestion is far advanced. It is this circumstance which has induced many persons to consider it as of a remarkably indolent disposition; but in this respect it does not differ from the Eagles, or indeed any other species of the same family. Toward the commencement of the breeding season it assumes more activity, and is more frequently seen soaring in circles. Its cry, which is loud and shrill, is also more commonly heard at this season.

In the wooded districts of England it is said to nestle on trees; but in Scotland it chooses for its nest a shelf of a rock, or the edge of a steep scar or bed of a hill torrent, and forms it of sticks, twigs, and heath, with a rude lining of wool and grass. The eggs, three or four in number, are broadly elliptical, two inches and a quarter in length, an inch and ten-twelfths in breadth, dull white, spotted and patched with yellowish-brown. During incubation, the male brings food to the female, and sometimes takes her place on the eggs. The young are at first covered with whitish down, and after leaving the nest are assisted by their parents until able to shift for themselves.

"The Common Buzzard," as Mr Hepburn informs me, "is a rare bird in Haddingtonshire. No one can help remarking its sluggish habits compared with those of the other Raptores found in the Lothians. It hunts the fields in a wavering direction, often turning and twisting, about a dozen or sixteen feet from the ground, dropping down on the unsuspecting mouse, and seizing the unwary bird perched on the hedge. So far as I have seen, it does not come near the dwellings of man in search of its food. One of these birds daily hunted our fields from August to November 1837, and again during the same period in 1838. Besides devouring mice, the Buzzard is of great service to the farmer in effectually driving off the Ring-Doves from the corn. Here you may see them feeding in flocks, often containing as many as 500 or sometimes above 1000. He

is accused of killing game, and suffers accordingly; but the gleanings of the fields are not left to maintain game alone, being shared by mice and small birds, and yet the poor Buzzard is shot when endeavouring to fulfil one of the great ends for which he was created, namely, setting bounds to their increase. When will our senators see the errors of game-laws, and the moral evils they inflict on the lower orders? Not till then will the farmer and nurseryman experience the full benefit of our rapacious birds."

This species, which is permanently resident, is still pretty numerous in many of our wilder districts. In Edinburgh, next to the Sparrow Hawk, Kestrel, and Merlin, it is that most frequently sent to the bird-stuffers. It is more plentiful in the interior than along the coast, and although it occurs in the larger Hebrides, it is rarely seen there, and in the Shetland Isles, as Dr Edmondston informs me, ranks merely as a straggler.

Young.—I have not examined a young bird taken from the nest, nor one that could with certainty be said to be in its first plumage, and have failed in my endeavours to obtain an account of one in this state, as no person of my acquaintance has paid attention to the subject. A male shot in October, having its plumage complete, and known to be a young bird by the softness and vascularity of its bones, was as follows.

The cere and soft margins of the bill greenish-yellow, the iris hazel, the tarsi and toes yellow with a tinge of green, the bill and claws black. The upper part of the head and the hind-neck are dark-brown, longitudinally streaked with yellowish-white, the lateral margins of the feathers being of that colour. The rest of the upper parts deep brown glossed with purple, all the feathers laterally margined with light-red; the scapulars and some of the large wing-coverts with several bands of white on their inner webs, of which the edge is mottled with reddish. The hind part of the back is of a uniform dark brown; but the upper tail-coverts are barred with light red. The primary quills are brownish-black, with the outer webs tinged with grey toward the end, the inner white from the base to be-

yond the middle, and having several irregular dusky bands. Tail banded with brownish-grey and blackish-brown, there being ten bands on the middle feathers, and twelve on the outer, the last dark band little larger than the next, the tips whitish. The sides of the head and throat are yellowish-white, streaked with brown; the rest of the lower parts yellowish-white longitudinally marked with oblong brown spots, the sides chiefly brown; the lower tail-coverts with a brown spot; the plumage of the legs and tarsi irregularly banded with brown and light red. The dull light-red edgings of the feathers are characteristic of the young, as is also the case in the Sparrow Hawk, Merlin, and many other species.

A female of the same age differs chiefly in having less white on the lower parts, the breast being of a nearly uniform brown, although on many of the feathers are large reddish-white spots. The feathers of the legs and tarsi are variegated with brown, white, and light red, as are those of the abdomen, and the lower tail-coverts are yellowish, barred with brown.

Progress toward Maturity.—At the next moult the bird assumes a more uniform brown colour on the upper parts, the light red markings becoming light brown, or brownish-white. It appears that, as it advances in age, the marginal white of the feathers extends, until the lower parts in the males become nearly white, there being merely an oblong brown spot on each feather, and the white predominates over the brown on the upper parts. In the females similar changes take place, but the lower parts are always more brown than in the males. I have seen some individuals that had the plumage white, with the exception of the quills, tail, and some oblong spots on the upper parts and breast. It thus appears that at first the colours of the plumage are darker than when the bird has attained maturity, and that the white predominates over the brown in old age; but it must be confessed that sufficiently correct observations have not been made on this subject, and that much remains to be done before the variations of colour in this species are well understood. The iris in young birds is brown, in adult birds yellow; and, as corroborative of the view which

I have taken above, Mr Fenton informs me that in all the very light-coloured birds which he has prepared the iris has been yellow.

M. Temminck states that in adult individuals, the upper parts, the neck and breast, are dark brown; the throat and belly brownish-grey, but variegated with spots of a darker brown, the tail with twelve transverse bands, the bill lead-colour, the cere, iris, and feet yellow. Very old individuals, he says, have the plumage very deep brown or chocolate colour, the throat whitish with small longitudinal brown streaks, some white transverse bands on the belly, and yellowish bands toward the abdomen. The young of the year, according to him, have the general colour light brown, variegated with whitish and yellowish, the throat white with longitudinal spots, the feathers of the breast bordered with white, the middle of the belly whitish with large longitudinal oval or cordate spots. Birds of this latter kind I think are old males, those described in the preceding sentence old females.

In the third part of his Manual he however alleges that all this has been confirmed by observations subsequently made, and yet inconsistently states that both the Common Buzzard and the Rough-legged Buzzard shew as many varieties of plumage as the Ruff. "No birds are more numerous in Holland than these two species of Buzzard; they come to us on their migration in autumn, and remain part of the winter in our climates. They all vary, without regard to sex, in size, without its being possible to find any regular difference in the colours of the plumage, which may be more or less variegated, barred, spotted, patched, or whitish with large brown markings." On the contrary, I think there is method in the colouring of these birds; and have no doubt that a few good observers might soon discover the order.

Gmel.

1. BUTEO LAGOPUS. THE ROUGH-LEGGED BUZZARD.

ROUGH-LEGGED FALCON.

Falco lagopus. Gmel. Syst. Nat. I. 260.
Falco lagopus. Lath. Ind. Orn. I. 19.
Rough-legged Falcon. Mont. Orn. Dict.
Buse pattue. Falco lagopus. Temm. Man. d'Orn. I. 65; III. 37.
Rough-legged Buzzard. Buteo lagopus. Selb. Illustr. I. 58.
Buteo lagopus. Rough-legged Buzzard. Jen. Brit. Vert. An. 87.

Tarsi feathered to the toes; upper parts brown, the head and neck streaked with white, lower parts yellowish-white, with a broad patch of brown on the breast; the tail white for more than half its length. Old birds almost entirely chocolate brown, the forehead and base of the tail white, the latter barred with white and brown?

In form, proportions, and plumage, the "Rough-legged Falcon" so closely agrees with the Common Buzzard, that, although it differs in having the tarsi feathered to the toes, in place of being feathered for half their length, I cannot consider it necessary to refer it to a separate genus. This species exhibits great variation in the tints of the plumage, and especially in the proportion of brown to yellowish-white, some individuals being almost entirely of the former colour, while in others the latter predominates.

Male.—Although females of this species often equal and sometimes exceed in size those of the Common Buzzard, the male is usually smaller than in that species. The general form is robust, the body being full, the neck rather short, the head very large, roundish, and flattened above. The bill is short and comparatively small, broader than high at the base; the dorsal line of the upper mandible declinate and slightly convex to the edge of the cere, then decurved in the fourth of a circle, its

edges with a very slight festoon, the tip trigonal and descending obliquely; the lower mandible with the angle wide, the dorsal line convex, the sides rounded, the edges sharp, inflected, and decurved at the tip, which is rounded and thin-edged. The nostrils are large and ovate; the eyes also large. The feet are rather short and robust; the tarsi roundish, feathered in their whole length; the toes short and proportionally smaller than in the Common Buzzard; the hind toe considerably shorter and scarcely stronger than the second, the fourth of about the same length, much more slender, and connected by a small web; the toes with transverse series of scales at the base, the first with five, the second with four, the third with seven, the fourth with four scutella. The claws are long, moderately curved, rather slender, very acute, that of the third toe with a thin edge along the inner side.

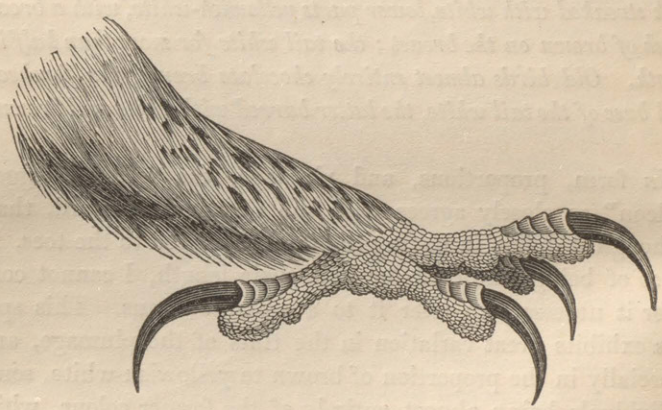


Fig. 213.

The plumage is full, remarkably soft and rather blended. The space between the bill and the eye is covered with small bristle-tipped downy feathers. On the head and neck the feathers are lanceolate, on the back and breast broadly ovate and rounded; on the legs short and narrow, those on the outer side of the tibia however being elongated and of an oblong form. The wings are long, reaching to the end of the tail, and much rounded; the first four quills with the inner web abruptly attenuated, the first six with the outer also narrowed; the secon-

daries broad and rounded; the first quill two inches and ten twelfths shorter than the second, which is an inch and a twelfth shorter than the third, the fourth slightly longer than the latter; the first and seventh about equal. The tail is long, broad, slightly rounded and slightly emarginate.

The cere and toes are yellow, the superciliary ridge greenish, the iris yellow; the bill and claws black, greyish-blue at the base. The radiating loral bristles black, their downy base white. The head and neck are yellowish-white, with linear-oblong streaks of umber-brown, the central part of each feather being of that colour; the back umber-brown tinged with grey, the feathers glossed with purplish toward the end, margined with yellowish-white and light reddish-brown, and having their concealed parts white. The edge of the wing is whitish, the brown feathers close to it margined with light red; the quills and larger coverts are brown, the primaries blackish-brown toward the end, the outer webs of the first six tinged with grey, and the base of all white, that colour being apparent on the outer edge of the outer four or five, and extending to the narrowed part of the inner web of all. The upper tail-coverts are white, with a large brown spot near the end; the tail white for nearly two-thirds from the base, the remaining or terminal part brown, but with a small portion of the tip brownish-white. The ground-colour of the fore-neck and the rest of the lower parts is yellowish-white or pale ochre, the throat with linear, the neck with lanceolate, the breast with obovate brown spots; but the sides and middle of the breast are brown; the abdomen and lower tail-coverts unspotted; the short plumage of the legs and tarsi reddish-yellow, mottled with dark brown; the elongated tibial feathers paler, with an oblong brown spot. The lower wing-coverts are yellowish-white, each with a narrow brown mark, but the larger or primary coverts chiefly brown; almost the whole under surface of the quills white, the attenuated part of the primaries being greyish-black, and the ends of the secondaries pale grey.

The alimentary canal, as examined in an American specimen, belonging to Mr Audubon, is in all respects similar to that of the Common Buzzard; the tongue being ten twelfths of

an inch long, fleshy, concave above, rounded; the œsophagus six and a half inches long, expanded into a crop two inches and eight twelfths in width; the stomach roundish, somewhat compressed, two inches and a quarter in diameter; its muscular coat thin; the pylorus with three knobs; the intestine three feet seven inches in length, from five twelfths to a twelfth and a half in width; the rectum four inches long, five and a half twelfths wide; the cloaca globular; the cœca three twelfths long.

Length to end of tail 21 inches; extent of wings 51; wing from flexure 17; tail $9\frac{1}{2}$; bill along the ridge $1\frac{4}{12}$; along the edge of lower mandible $1\frac{7}{12}$; tarsus $2\frac{1}{2}$; hind toe $\frac{8\frac{1}{2}}{12}$, its claw $1\frac{3}{12}$; second toe $\frac{9\frac{1}{2}}{12}$, its claw $1\frac{1}{12}$; third toe $1\frac{3}{12}$, its claw $\frac{11}{12}$; fourth toe $\frac{10}{12}$, its claw $\frac{8}{12}$.

Female.—The female, which is much larger, resembles the male in colour; an adult individual in my collection differing only in having the light-coloured parts more tinged with yellow, the small wing-coverts more largely edged with brownish-red, the scapulars and larger wing-coverts broadly margined with yellowish-white; but as scarcely two adult individuals agree in every particular, it is inexpedient to enter into a very minute description.

In an individual killed in Fifeshire in December 1839, the œsophagus was seven inches long, the crop two inches and a half in width; the stomach two inches in diameter; the intestine four feet one inch long; the cœca three twelfths, and the cloaca an inch and a quarter in diameter.

Length to end of tail $23\frac{1}{2}$ inches; extent of wings 56; wing from flexure 18; tail 10; bill along the ridge $1\frac{5}{12}$; tarsus $2\frac{8}{12}$; first toe $\frac{10}{12}$, its claw $1\frac{5}{12}$; second toe $\frac{10\frac{1}{2}}{12}$, its claw $1\frac{2}{12}$; third toe $1\frac{1}{2}$, its claw $\frac{11}{12}$; fourth toe $1\frac{1}{12}$, its claw $\frac{8\frac{1}{2}}{12}$.

Variations.—Although the individuals commonly met with present a considerable diversity of colouring, I do not find that the differences are of much importance, being confined to changes in the relative extent of the white and brown markings, stronger shades of yellow on the white, and the presence or absence of red-

dish margins. Indications of bars on the tail are usually met with, and its broad brown band is darker or lighter.

Habits.—The Rough-legged Buzzard, which is a native of the colder regions of both continents, now and then makes its appearance in Britain, toward the end of autumn or in winter; but if it ever remains to breed with us, the instances must be extremely rare, and I am unable to find any description of its nest, eggs, or young, as observed in this country. In the southern division of Scotland it has several times been procured, and, as Mr Yarrell remarks, "it has been killed once or oftener in every county in England." ~~Yet~~ Mr Selby, ~~I believe~~, ~~is the only person who~~ has described its habits from personal observation, he having had an opportunity of watching two birds that had settled in his neighbourhood. "Their flight," he says, "was smooth, but slow, and not unlike that of the Common Buzzard, and they seldom continued for any length of time on the wing. They preyed upon wild ducks and other birds, which they pounced upon on the ground; and it would appear that mice and frogs must have constituted a great part of their food, as the remains of both were found in the stomachs of those that were killed."

Removed up, near p. 136

On the continent, according to M. Temminck, it inhabits the borders of woods, in the vicinity of water; in autumn and winter is frequent in the northern countries, and sometimes makes its appearance in Holland, usually in company with the Common Buzzard. Its food, he says, is composed of water-rats, hamsters, moles, young rabbits, hares and birds, often of serpents and frogs. From the Scandinavian Peninsula and other northern parts it is seen as far south as the shores of the Mediterranean, and is even said to have been met with at the Cape of Good Hope.

In America it is confined to the northern parts. According to Dr Richardson, "it arrives in the fur countries in April or May, and, having reared its young, retires southward early in October. It winters on the banks of the Delaware and Schuylkill, returning to the north in spring. It is by no means an uncommon bird in the districts through which the expedition

travelled, but, being very shy, only one specimen was procured. A pair were seen at their nest, built of sticks, on a lofty tree, standing on a low, moist, alluvial point of land, almost encircled by a bend of the Saskatchewan. They sailed round the spot in a wide circle, occasionally settling on the top of a tree, but were too wary to allow us to come within gun-shot; so that, after spending much time in vain, we were fain to relinquish the chase. In the softness and fulness of its plumage, its feathered legs, and habits, this bird bears some resemblance to the owls. It flies slowly, sits for a long time on the bough of a tree, watching for mice, frogs, &c., and is often seen skimming over swampy pieces of ground, and hunting for its prey by the subdued daylight, which illuminates even the midnight hours in the high parallels of latitude."

Mr Audubon found it plentiful in winter in the neighbourhood of Boston, and observed it in various places from the Bay of Fundy to the eastern parts of North Carolina, beyond which it seldom proceeds. "It is a sluggish bird," he says, "and confines itself to the meadows and low grounds bordering the rivers and salt-marshes, along our bays and inlets. In such places you may see it perched on a stake, where it remains for hours at a time, unless some wounded bird comes in sight, when it sails after it and secures it without manifesting much swiftness of flight. It feeds principally on moles, mice, and other small quadrupeds, and never attacks a duck on the wing, although now and then it pursues a wounded one. When not alarmed, it usually flies low and sedately, and does not exhibit any of the courage and vigour so conspicuous in most other hawks, suffering thousands of birds to pass without pursuing them. The greatest feat I have seen them perform was scrambling at the edge of the water, to secure a lethargic frog. They alight on trees to roost, but appear so hungry and indolent at all times, that they seldom retire to rest until after dusk. Their large eyes indeed seem to indicate their possession of the faculty of seeing at that late hour. I have frequently put up one, that seemed watching for food at the edge of a ditch, long after sunset. Whenever an opportunity offers, they eat to excess, and, like the Turkey Buzzards and Carrion Crows, disgorge their

food, to enable them to fly off. The species is more nocturnal in its habits than any other hawk found in the United States." Although it has not been met with between the Alleghanies and the Rocky Mountains, Dr Townsend found it breeding on the banks of Bear River, westward of the latter. "Its nest was placed in a willow, ten feet from the ground, and formed of large sticks. It contained two young almost fledged."

Remarks.—A hawk precisely similar in every respect, excepting colour, to the Rough-legged Falcon, was described by Pennant and Wilson under the names of Falco Sancti-Johannis and Falco niger. This bird Mr Audubon, by an extensive comparison of specimens, found to be identical with that species, and it has been referred to by Nillson as the young of the Buteo lagopus. Mr Audubon, however, is positive as to its being the old bird, and gives analogical and other reasons in support of his opinion, young birds taken from the nest not having been seen by him. These reasons will be found in the second and fifth volumes of his Ornithological Biography. The state of plumage alluded to is chocolate or blackish-brown, but with some of the characteristic markings of the species, such in particular as the white bases of the quills, remaining.

No person, however, has seen these black individuals breeding; but on the contrary, Dr Richardson, as mentioned above, observed a pair of the usual colour having a nest; and Dr Townsend, in stating the fact mentioned above, concludes with saying "the birds were in the same plumage as that figured by you"—*that* individual *then* figured being an ordinary Buteo lagopus. It is thus clear that the light-coloured birds breed, and therefore must be considered adult, unless the black be also found breeding, in which case some additional circumstance would be required to settle the question. If the old birds are black, how is it that none have ever been seen in Britain, or in Holland, although these countries are not by any means on the limits of their migration, the species occurring as far south as the Mediterranean? On the other hand, if the young birds are black, how do they not appear in these countries, since in the southward migration of an arctic bird the young generally proceed farthest? There are two ways of solving the difficulty. The dark-

coloured birds are those in their *first* or nestling plumage; or they may, on a more minute examination, and on being kept some years in captivity, turn out to be of a different species.

The birds alluded to above are as follows:—Bill bluish-black; cere and basal margins orange; feet orange; iris hazel, superciliary ridge dull green; general colour of the plumage blackish-brown or chocolate-brown; the inner webs of the quills, the nape under the surface, and the forehead, white; the feathers of the legs barred with reddish; the tail deep black, with five narrow white bands, and tipped with brownish-white. A male in this state in Mr Audubon's collection had "the general colour of the plumage deep blackish-brown; the forehead and a large patch on the hind-neck white, streaked with blackish-brown; all the feathers of the back, the scapulars, the wing-coverts, the quills, and the tail-feathers, are white toward the base, and more or less barred with whitish, or light grey, or pale brown; in consequence of which the upper parts are obscurely mottled; the axillar feathers, some of those on the sides, and some of the tibial feathers, with the lower tail-coverts, are similarly marked; the white forms a conspicuous patch on the under surface of the wing, as it occupies the greater part of the primaries as well as part of the inner webs of the secondaries; the tail brownish-black, barred with greyish-white, tinged with brown, there being on the middle feathers six of these black bands, the last very broad, the tips brownish-white.

If these really belong to this species, we might suppose that the young, at first of a nearly uniform dark brown, but with the bases of all the feathers white, gradually become lighter, the brown colour contracting so that the edges of the feathers become white or yellowish until the brown is reduced to mere streaks on the head and neck. The tail, at first banded with blackish-brown and white, ultimately becomes brown, the basal part being white at all ages; or, in other words, the bands, at first numerous, are ultimately reduced to one; as is the case with Buteo borealis, Falco sparverius, and F. Tinnunculus, and to a less extent with Buteo pennsylvanicus, in which the young has seven dusky bars, while the adult has only three.

A specimen from Dumfriesshire. 93.737.

Briss.

Genus III. AQUILA. EAGLE.

Bill shorter than the head, very high, at the base of nearly the same breadth and height, gradually compressed: upper mandible with the cere broad and bare, the dorsal line nearly straight along the cere, then decurved in about the third of a circle, the ridge broad and convex on the cere, narrowed but convex in the rest of its extent, the sides sloping, toward the end slightly convex, the edges soft to beneath the nostrils, then sharp, with a slight festoon, the tip prolonged, slightly curved inwards, trigonal, acute, concave beneath; lower mandible with the angle of moderate width, and rounded, the edges soft, obtuse and straight for half their length, towards the end sharp, inflected, and decurved, the dorsal line convex, as are the sides, the tip rounded and thin-edged.

Mouth wide; palate flat, with two longitudinal soft prominent papillate lines; upper mandible slightly concave within, the lower more deeply concave; posterior aperture of nares oblong, with an anterior slit. Tongue fleshy, deeply emarginate and papillate at the base, with one of the lateral papillæ large, concave above, the sides nearly parallel, the tip rounded, slightly emarginate. Œsophagus very wide, dilated into a very large crop lying toward the right side. A broad belt of proventricular glands. Stomach large, roundish, its muscular coat thin and composed of a single series of fasciculi; the tendinous spaces round and thin. The intestine rather short, wide, at the anterior part, very narrow toward the rectum, the duodenum forming a single loop; cœca very small, cloaca very large and globular. Plate XX, Fig. 2.

Nostrils broadly elliptical, oblique, subbasal, in the fore part of the cere. Eyes large, with a broad projecting superciliary ridge; eyelids bare, edged with bristly feathers having a few filaments at the base. External aperture of ear large, round,

with a broadish dermal margin, beset with linear-lanceolate feathers.

The body is robust and compact, of great breadth anteriorly; the neck of moderate length; the head large, roundish, very broad behind, flattened above. The feet of moderate length, extremely muscular; the tarsus very short, thick, round, feathered to the tarso-digital joint, in some species partially bare and scaly. The toes of moderate length, very stout; the first and second shortest and thickest, the fourth next in length, but the most slender; the third and fourth connected by a pretty large web, the third and second by a very slight one; all covered above by transverse series of roundish scales, scutellate toward the end. Claws strong, tapering, curved, rounded above, laterally flattened, very acute, concave, and marginate beneath; the first and second largest, the fourth remarkably small, the third with an edge and a broad groove on the inner side.

Plumage compact and imbricated. The space from the eye to the cere covered with very small bristle-feathers, which are downy at the base. On the head and neck the feathers are lanceolate and pointed, on the body broadly ovate; the scapulars large and strong; outer tibial feathers elongated, the rest short. The fore part of the breast in the region of the furcula, the abdomen and part of the sides covered with downy feathers only; but a large tuft from the thorax overlaps the abdomen. Wings very long, broad, and rounded, with twenty-seven quills, and six strong humerals. The first quill of the same length as the eighth, the second shorter than the fifth, the fourth longest, the third almost as long; the first six are abruptly cut out on the inner web, and narrowed on the outer, leaving large intervals when the wing is expanded; the primaries pointed, the secondaries very broad, broadly obtuse, with a minute tip. Tail of moderate length, or rather long, rounded, extending considerably beyond the tips of the wings, broad, of twelve very broad feathers.

This genus is composed of birds of large or moderate size, some of which approach the Haliaëti in form, while others manifest a direct affinity to the Buzzards. In Haliaëtus, the

bill is longer and higher, the feet larger, and the tarsi bare. A still more distinctive character exists in the intestinal canal, which is extremely elongated and narrow, with a singularly convoluted duodenum in Haliaëtus, whereas in Aquila it is short, rather wide, and with the duodenum of the usual form. The Eagles are powerful and vigorous birds, rather heavy and somewhat slow, like the Buzzards, but differing from the Haliaëti in feeding less on carrion than on animals killed by themselves. They nestle in rocks, whether on the sea-shore or in the interior, prefer mountainous regions, and are generally distributed, one or more species occurring in every known region. In Britain only one is met with, which is now almost entirely confined to the northern parts.

I have ascertained, by comparing birds shot in winter with those newly fledged, that the young retain their first plumage until the following spring, or, at least, that the colouring of their winter plumage is similar to that of their first state. The Foot here represented, and the Head on the following page, are those of a young male shot in winter.

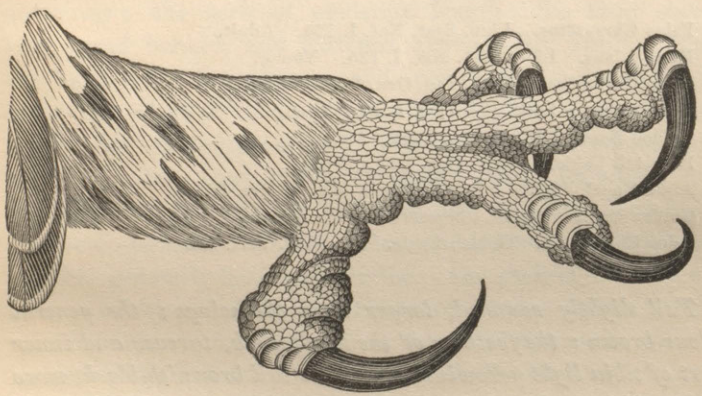


Fig. 214.

1. AQUILA CHRYSAËTUS. THE GOLDEN EAGLE.

BLACK EAGLE. RING-TAILED EAGLE. BROWN EAGLE. IOLAIR DHUBH.

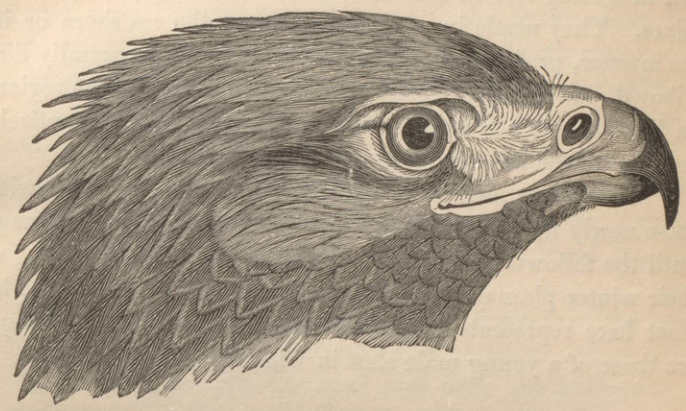


Fig. 215.

Falco Chrysaëtos. Linn. Syst. Nat. I. 125. Adult.
Falco fulvus. Linn. Syst. Nat. I. 125. Young.
Falco Chrysaëtos. Lath. Ind. Orn. I. 12. Adult.
Falco fulvus. Lath. Ind. Orn. I. 10. Young.
Golden Eagle. Mont. Orn. Dict. Adult.
Ring-tail Eagle. Mont. Orn. Dict. Young.
Aigle Royal. Falco fulvus. Temm. Man. d'Orn. 38.
Golden Eagle. Aquila Chrysaëtus. Selb. Illustr.
Falco Chrysaëtus. Golden Eagle. Jen. Brit. Vert. An.

Tail slightly rounded, longer than the wings; the general colour brown; the feathers of the head, neck, tarsus, and inner part of tibia light yellowish-brown, the tail brownish-black, more or less variegated with grey. Young dark-brown, with the basal half of the tail white.

The Golden Eagle, which, with the exception of the White-tailed Sea-Eagle, is the largest of our Raptores, is the only

bird of its genus that occurs in Britain. The disparity between the male and the female is as great as in any species of this family, some individuals of the former measuring only two feet and a half in length, while many of the latter extend to three feet two inches. If not the most celebrated, it is at least the most esteemed of its tribe, and, through the misrepresentations of poets and amateur naturalists, possesses a character for courage and generosity, which a more intimate acquaintance with it than such persons usually acquire, soon suffices to dispel. Yet the Eagle is a magnificent bird, and when met with on some grim alpine crag projecting from the grey mist, inspires a kind of respect, of which some degree of fear is an essential ingredient. Even in the menagerie he has a truculent aspect, with those bright but overshadowed eyes, that harmonizes with his wild nature; and, here, extended dead on the table, as just arrived from the Braes of Lochaber, his broad chest and brawny limbs indicate a power capable of giving effect to those death-dealing talons and expansive wings.

Male.—The body is robust, compact, ovate, very broad anteriorly; the neck of moderate length; the head short, very broad behind, and flattened above. Bill shorter than the head, very deep, compressed toward the end; the cere large, the edges of the upper mandible with a slight festoon, its tip trigonal and decurved. The legs are rather long, and very muscular; but the tarsi short, stout, roundish, and feathered to the joint. The toes are covered above with transverse series of roundish scales, padded beneath, with soft conical, generally flattened papillæ. On each of the toes are four terminal scutella. The claws are strong, tapering, acuminate, curved, rounded above, laterally flattened, concave beneath; the first and second largest, the fourth comparatively very small.

The upper mandible is concave within, and has a median ridge; the palate flat, with two longitudinal papillate ridges. The posterior aperture of the nares oblong behind, linear

before, margined with minute papillæ. The tongue is an inch and a quarter in length, concave above, emarginate and papillate at the base, horny beneath, with the tip rounded and slightly emarginate. The œsophagus is thirteen inches long, at the commencement an inch and a half in width, but presently enlarging to form a great sac or crop three inches in width, and four in length; it then contracts on entering the thorax, and again enlarges to the width of an inch and a half. Its transverse muscular fibres are conspicuous in its whole extent, and on its inner surface open numerous mucous crypts. The stomach is roundish, a little compressed, two inches and a half in diameter, its tendons seven-eighths, its muscular coat thin, and composed of a single series of fasciculi. The proventricular glandules, which are cylindrical, form a continuous belt an inch and a half in breadth. The intestine is four feet eight inches in length, at its anterior part seven twelfths in width, toward the rectum only two-twelfths. The cœca are two-twelfths and a half long. The rectum is six inches and a half in length, about nine-twelfths in width, but enlarges into a globular sac two inches in diameter. Plate XX, Fig. 2.

The nostril, which is broadly elliptical, oblique, with a soft ridge internally from the upper side, is five-twelfths long, and three-twelfths in breadth. The aperture of the eye is eight-twelfths, that of the ear five-twelfths.

The cere is bare above, but its sides, and a broad space from the bill to the eye, are covered with bristle-feathers, having a few downy filaments at their base; the supraocular ridge is bare, as are the eyelids, which however are ciliated. On the head the feathers are small, narrow, lanceolate, and acuminate; on the neck similar, but larger and broader; on the back ovate and acuminate, those before larger; the scapulars large and strong; on the lower parts also ovate, on the tibia and tarsus short and blended, on the outer side of the former elongated. The feathers of the abdomen are loose and downy. The wings, which when closed reach nearly to the end of the tail, are very long and broad; the primaries ten, the secondaries seventeen, the humerals six of large size; the outer

six quills abruptly cut out on the inner, and gently attenuated on the outer web; the fourth longest, the third a quarter of an inch shorter, the second an inch and a third shorter than the fourth, the first five inches and a half shorter, and of the same length as the eighth. The tail is of moderate length, nearly straight, broad, and slightly rounded, the lateral feathers being only three quarters of an inch shorter than the longest.

The bill and claws are black, shaded toward the base into greyish-blue; the cere and soft skin at the base of the bill rich yellow; the bare part of the eyelids flesh-colour; the iris hazel; the toes rich pure yellow, their soles of the same colour but paler. The bristly feathers about the base of the bill are black. The feathers of the upper part of the head, the hind part and sides of the neck light yellowish-brown; those of the inner and fore part of the tibia, and of the tarsus all round, of a light reddish-brown; as are the lower tail-coverts. The general colour of the rest of the plumage is deep-brown, glossed with purple; the edges of the wings pale brownish-grey; most of the wing-coverts and the inner secondaries umber-brown, margined with paler. Alula, primary coverts and primary quills brownish-black; their inner webs irregularly barred with greyish-white, as are both webs of most of the secondaries. The tail is dark brown, blackish toward the end, but toward the base paler, with irregular pale greyish-brown markings. On all parts of the body the bases of the feathers are white; the down on the breast, abdomen, and sides pale grey, on the latter intermixed with brown.

Length to end of tail 33 inches; extent of wings 72; bill along the ridge $2\frac{8}{12}$, along the edge of lower mandible $2\frac{6}{12}$, cere $\frac{9}{12}$; wing from flexure 24; tail $12\frac{1}{2}$; tarsus 4; first toe $1\frac{8}{12}$, its claw $2\frac{4\frac{1}{2}}{12}$; second toe $1\frac{7\frac{1}{2}}{12}$, its claw $2\frac{3}{12}$; third toe $2\frac{5}{12}$, its claw $1\frac{1}{2}$; fourth toe $1\frac{10}{12}$, its claw $1\frac{2\frac{1}{2}}{12}$.

Female.—The female greatly exceeds the male in size, but scarcely differs in colouring. One from Inverness-shire, which weighed twelve pounds fourteen ounces, had the fifth quill longest, the fourth next, the third and sixth scarcely shorter,

the first four inches and a half shorter than the second, which was half an inch shorter than the third; the tail very slightly rounded, the lateral feathers only ten-twelfths shorter than the longest. The general colour of the plumage dark-brown; the upper part of the head, hind part and sides of the neck, inner tibial feathers, those of the tarsus, and the lower tail-coverts, yellowish-brown. The edge of the wing greyish-brown; the wing-coverts and inner secondaries edged with brownish-white; the primary quills brownish-black, their inner webs mottled with greyish; the secondaries brown, with their inner and part of their outer webs variegated with greyish-white. The tail brownish-black at the end, greyish-brown in the rest of its extent, with faint irregular bars of grey. The base of the plumage white, conspicuous on the hind-neck, when the feathers are raised.

Length to end of tail 37 inches; extent of wings 87; wing from flexure $26\frac{1}{2}$; tail 14; bill along the ridge $2_{\frac{9}{12}}$, along the edge of lower mandible $2\frac{1}{2}$, cere $1_{\frac{0}{2}}$; tibia $7\frac{1}{2}$; tarsus $4\frac{1}{2}$; first toe $1_{\frac{9}{12}}$, its claw $2_{\frac{9}{12}}$; second toe $1_{\frac{9}{12}}$, its claw $2_{\frac{2}{12}}$; third toe $2_{\frac{5}{12}}$, its claw $1_{\frac{10}{12}}$; fourth toe $1_{\frac{1}{12}}$, its claw $1_{\frac{4}{12}}$.

Variations.—Adult individuals differ little in colour. Males vary from two feet six inches to thirty-four inches or somewhat more; females from two feet ten to three feet two or three inches. Males generally measure about six feet in alar extent, and females about seven; the smallest male measured by me was only five feet six, and the largest female seven feet three inches; but larger measurements have been given. The following tables of variations in the number of scutella, and in the dimensions of the digestive organs, may be useful:—

	M.	M.	M.	M.	F.	F.	F.	F.	F.
Scutella on first toe	4	4	3	3	4	4	4	3	4
Second toe	3	3	3	3	3	4	3	4	4
Third toe	4	3	4	3	4	4	3	5	3
Fourth toe	3	3	3	3	3	4	3	4	3

	M.	M.	M.	F.	F.	F.
Tongue in length....	$1\frac{1}{4}$	—	—	$1\frac{3}{12}$	—	—
Œsophagus.....	13	12	12	$12\frac{3}{4}$	13	14
Crop in width.....	$3\frac{1}{4}$	3	3	3	3	—
Stomach.....	$2\frac{1}{4}$	$2\frac{1}{2}$	—	$2\frac{1}{4}$	—	2
Intestine.....	50	56	51	66	68	65
Length of duodenum	—	—	9	14	—	—
Greatest width.....	$\frac{7}{12}$	$\frac{3}{4}$	—	$\frac{10}{12}$	—	—
Least width.....	$\frac{2\frac{1}{2}}{12}$	$\frac{1}{4}$	—	$\frac{3}{12}$	—	—
Cœca in length.....	$\frac{5}{12}$	$\frac{2}{12}$	$\frac{3}{12}$	$\frac{4}{12}$	—	$\frac{3}{12}$
Rectum.....	—	$6\frac{1}{2}$	—	7	7	—
Cloaca in diameter...	2	—	—	2	2	$2\frac{1}{4}$

Changes of Plumage.—The moult appears to commence about the middle of spring and to be completed in December; but I have never examined an Eagle at any season without finding new feathers. When old the feathers are generally ragged, irregularly pointed, and of a light greyish-brown colour; when new of a rich brown glossed with purple, many of them brownish-black. The wing-coverts seem to be the feathers last renewed.

Habits.—The Golden Eagle is not seen to advantage in the menagerie of a zoological society, nor when fettered on the smooth lawn of an aristocratic mansion, or perched on the rock-work of a nursery-garden; nor can his habits be well described by a ~~cockney~~ ornithologist, whose proper province is to concoct systems, "work out" analogies, and give names to skins that have come from foreign ~~lands~~ carefully packed in boxes lined with tin. Far away, among the brown hills of Albyn, is thy dwelling-place, chief of the rocky glen! On the crumbling crag of red granite that towers over the fissured precipices of Loch-na-gar thou hast reposed in safety. The croak of the Raven has broken thy slumbers, and thou gatherest up thy huge wings, smoothest the feathers on thy sides, and preparest to launch into the aërial ocean. Bird of the desert, solitary though thou art, and hateful to the sight of many of thy fellow creatures, thine must be a happy life. No lord hast thou to bend thy stubborn ~~soul~~ to his ~~will~~, no cares corrode thy heart, sel-

dom does fear chill thy free spirit, for the windy tempest and the thick sleet cannot injure thee, and the lightnings may flash around thee and the thunders shake the everlasting hills, without rousing thee from thy dreamy repose. Thou hast a good conscience, and what shouldst thou dread, although a thousand victims have been sacrificed to thy lust of rapine, and even now the blood of that helpless fawn which thy keen eye discovered among the long heath crusts thy hooked bill. Thou hast a commission to plunder; thou art a robber by right; mercy and peace are not of the elements of thy nature; like the ancient Gael of those wild glens thou goest about armed for strife; even thy love is fierce, and thy nurslings are nurtured with blood. Proud bird of the desert, how joyous must thou be, when on strong wings thou glidest over the mountain-tops, and soarest away into the blue sky, until the clouds are beneath thee, and thou floatest in the ether, nearer to heaven than living thing has ever been. ~~Oh that I too had the wings of an Eagle, that I might visit the place of thy rest, and perch on a pinnacle beside thy mate as she broods over her young ones on the rocks of Glen Dee~~. But thou art now almost ready, and before thou startest, let me take thy portrait.

See how the sunshine brightens the yellow tint of his head and neck, until it shines almost like gold! There he stands nearly erect, with his tail depressed, his large wings half raised by his side, his neck stretched out, and his eye glistening as he glances around. Like other robbers of the desert, he has a noble aspect, an imperative mien, a look of proud defiance; but his nobility has a dash of clownishness, and his falconship a vulturine tinge. Still he is a noble bird, powerful, independent, proud, and ferocious, regardless of the weal or woe of others, and intent solely on the gratification of his own appetites; without generosity, without honour, bold against the defenceless, but ever ready to sneak from danger. Such is his nobility, about which men have so raved. Suddenly he raises his wings, for he has heard the whistle of the shepherd in the corry, and, bending forward, he springs into the air. would ~~Oh~~ that this pencil of mine were a musket charged with buckshot! Hardly do those vigorous flaps serve at first to prevent

into the corry

his descent; but now, curving upwards, he glides majestically along. As he passes the corner of that buttressed and battlemented crag, forth rush two ravens from their nest, croaking fiercely. While one flies above him, the other steals beneath, and they essay to strike him, but dare not, for they have an instinctive knowledge of the power of his grasp, and after following him a little way they return to their home, vainly exulting in the thought of having driven him from their neighbourhood. Bent on a far journey, he advances in a direct course, flapping his great wings at regular intervals, then shooting along without seeming to move them. In ten minutes he has progressed three miles, although he is in no haste, and now disappears behind the shoulder of the hill. But we may follow him in imagination, for his habits being well known to us, we may be allowed the ornithological license of tracing them in continuance. Homeward bound, his own wants satisfied, he knows that his young must be supplied with food.

Over the moors he sweeps, at the height of two or three hundred feet, bending his course to either side, his wings widespread, his neck and feet retracted, now beating the air, and again sailing smoothly along. Suddenly he stops, poises himself for a moment, stoops, but recovers himself without reaching the ground. The object of his regards, a Golden Plover, which he had spied on her nest, has eluded him, and he cares not to pursue it. Now he ascends a little, wheels in short curves, presently rushes down headlong, assumes the horizontal position when close to the ground, prevents his being dashed against it by expanding his wings and tail, thrusts forth his talons, and grasping a poor terrified ptarmigan that sat cowering among the grey lichens, squeezes it to death, raises his head exultingly, emits a clear shrill cry, and springing from the ground pursues his journey.

at Hawks Glen Callader

In passing a tall cliff that ~~overhangs a small lake~~, he is assailed by a fierce Peregrine Falcon, which darts and plunges at him, as if determined to deprive him of his booty, or drive him headlong to the ground. This proves a more dangerous foe than the Raven, and the Eagle screams, yelps, and throws himself into postures of defence; but at length, the hawk, see-

ing the tyrant is not bent on plundering his nest, leaves him to pursue his course unmolested. Over woods and green fields and scattered hamlets, speeds the Eagle, and now he enters the long valley of the Dee, near the upper end of which is dimly seen through the thin grey mist the rock of his rest. About a mile from it he meets his mate, who has been abroad on a similar errand, and is returning with a white hare in her talons. They congratulate each other with loud yelping cries, which rouse the drowsy shepherd on the strath below, who mindful of the lambs carried off in springtime, sends after them his malediction. Now they reach their nest, and are greeted by their young with loud clamour.

Let us mark the spot. It is the shelf of a rock, concealed by a projecting angle, so that it cannot be injured from above, and too distant from the base to be reached by a shot. In the crevices are luxuriant tufts of Rhodiola rosea, and scattered around are many alpine plants, which it would delight the botanist to enumerate. The mineralogist would not be less pleased could he with chisel and hammer reach that knob which glitters with crystals of quartz and felspar. The nest is a bulky fabric, five feet at least in diameter, rudely constructed of dead sticks, twigs, and heath, flat, unless in the centre, where it is a little hollowed and covered with wool and feathers. Slovenly creatures you would think those two young birds, clothed with white down, amid which the larger feathers are seen projecting, for their fluid dung is scattered all over the sticks, and you see that had the nest been formed more compactly of softer materials it would have been less comfortable. Strewn around too are fragments of lambs, hares, grouse, and other birds, in various stages of decay. Alighting on the edges of the nest, the eagles deposit their prey, partially pluck off the hair and feathers, and rudely tearing up the flesh, lay it before their ever-hungry young.

The nest of the Golden Eagle is sometimes plundered by letting a person down to it on a rope, and more rarely by climbing to it. This species is bolder than the Sea Eagle, and has been known to attack individuals thus occupied. In Sutherland, two young men having plundered a nest, were returning

There is danger either way, but man, who has more fears than the Eagle, has also more courage. The rope may be cut as it glides over some thin edge of rock, or it may loosen the fragments that have been formed by alternate frosts and thaws. An unaided ascent is still worse, and when the nest is reached, and the fierce birds are threatening an attack, it is with very uneasy feelings that the plunderer plans his far more difficult downward route.

with the spoil, when they were assailed by one of the eagles, which repeatedly struck at them with her wing. In Forfarshire, a farmer in ascending to an eagle's nest, was encountered by the old bird, which had returned with food for the young, and escaped only by throwing to her his bonnet, after which she flew to the ground, and on returning was shot by him. If any of the stories told respecting children that have been carried off by eagles be true, it is probable that the feat has been performed by this species. Should one of the birds be shot during the breeding season, it has been observed that the survivor generally procures a mate in a very short time, and that even after the young have been hatched. The eggs are usually two, sometimes only one, and very rarely three. They are inferior in size to the egg of a domestic goose, of a broadly oval shape, three inches in length, two inches and four-twelfths in breadth, yellowish-white, clouded and spotted with light brown, sometimes white, with a few reddish dots. One in my possession, which was taken from the oviduct, is pure white, but probably it would have received some colouring matter, which is deposited after the shell is completed, had the bird not been shot.

The food of the Golden Eagle consists of the flesh of hares, rabbits, lambs, fawns, moles, black-grouse, red-grouse, ptarmigans, partridges, curlews, plovers, lapwings, and probably other species. I have seen one carry off a lamb several weeks old, and have been informed by the shepherds in the Hebrides that it thus commits great havock in the beginning of summer. One of them also told me that he had seen two eagles, but whether of this or of the other species he did not know, attack a doe in winter, which they would probably have destroyed had he not interfered. Although it does not much frequent the sea-shore, it does not disdain a dead fish, and in winter it often eats carrion. I have seen several Golden Eagles hovering over and around a dead sheep, and in the Hebrides they are often shot on carcases placed near a covered pit in which the gunner lies concealed. The substances which I have found in the crops and stomachs of Golden Eagles from the Highlands that were sent to the bird-stuffers in Edinburgh, were portions of hares, ptarmigans, grouse, wool, and once a mole.

In his "Description of the Western Islands," Martin has the following notice to the same effect. "The Eagles are very destructive to the Fawns and Lambs especially the black Eagle, which is of a better size than the other. The natives observe that it fixes its Talons between the Deer's Horns, and beats its wings constantly about their Eyes, which hurts the Deer to run continually till it fall into a Ditch, or over a precipice, where it dies and so becomes a prey to this cunning Hunter. There are at the same time several other Eagles of this kind which flye on both sides of the Deer, which frights it exceedingly, and contributes much to its more sudden destruction. The forresters and several of the Natives assured me, that they had seen both sorts of Eagles kill Deer in this manner." p. 71.

In searching for prey, it flies at no great height, sometimes only a few yards from the ground, generally two or three hundred feet, advancing with regular flaps of the wings and alternate sailings, often wheeling in circles wide or narrow according to circumstances. It never balances itself in a particular spot, hovering, in the manner of the Kestrel, with a rapid undulating motion of the wings, its weight and the great length of those members, rendering, I suppose, such a mode of exploring the ground beneath it impracticable. On such occasions it moves in silence, and often solitarily, but I have many times seen a pair flying together. Should they meet another bird of the same species, or a White-tailed Sea-Eagle, they usually emit their loud yelping cries, and maintain a proper distance. These cries are louder and clearer than those of the species just mentioned, but precisely similar in character.

It is chiefly in the Outer Hebrides that I have studied the habits of the Golden Eagle, which, however, is less common there than the other species, although by no means rare. It occurs in all the mountainous parts of the northern and middle divisions of Scotland, both in the maritime and inland districts, but is far more numerous in the western than in the eastern portions of these divisions. Individuals are now and then met with in the southern division, and in various parts of England, but it seems doubtful that any now breed to the south of the Friths of Clyde and Forth. Vast numbers have of late years been destroyed in consequence of the extension of sheep-farming in the Highlands; and upwards of twenty individuals appear to be annually prepared in Scotland as domestic ornaments.

In a state of captivity the Golden Eagle usually retains all its original ferocity, and cannot be much trusted, although perhaps somewhat more generous than the White-tailed Sea-Eagle. One or two instances, however, are mentioned of its having been perfectly tamed, and even trained to hunt. It is commonly reported to attain a very old age.

On the Continent of Europe its distribution extends from Norway to the Alps and Pyrenees; and in North America it has been observed from Labrador to Pennsylvania.

Mr Low, in his Fauna Orcadensis, has the following statement respecting this species:—"It is very frequent in the hills, where it makes its nest in the rocks, which is often placed within reach, and, when this is the case, always becomes a prey to destruction. These birds are very strong, and make vast havock (in breeding time especially) among lambs and young and old swine, which they often destroy in the mountains, rabbits, and poultry. A clergyman some time ago told me he met with one of them mounted in the air, with a pretty large pig in her talons, which she dropt alive upon his firing at her. We have even a tradition here of an eagle's having taken up a child from behind some reapers, in the Parish of Orphir, and carried it to her nest in Hoy; but by the assiduity of the people, who immediately followed her, the child was rescued." In the island of Harris there is a similar tradition of an eagle's having carried a child across the Minsh to the island of Skye, a distance of more than sixteen miles. Mr Dunn states that in Orkney the Golden Eagle breeds among the cliffs on the west side of Hoy Hill, but is so scarce that he only saw a single pair. In Shetland it ranks in the account of the birds of that country sent to me by Dr Edmondston as a very rare visitant.

Among the "vulgar errors" which the light of truth has not yet entirely dispelled, is the notion of eagles soaring to a great height that they may have the pleasure of gazing on the unclouded glory of the sun, for which purpose it is said their eyes are furnished with a semi-transparent membrane, that is drawn over the cornea to prevent the injury likely to result from too great a blaze of light. But all birds, the red grouse, for example, the domestic goose, the sparrow, which no one suspects of a peculiar or poetical propensity to admire the sunbeams, have a membrane of the same kind as that of the Eagle. Another error is, that Eagles soar to a vast height for the purpose of surveying the subjacent lands and sea, in order to discover their prey. I have never seen an eagle descend upon an object from such a height, and when obviously searching for food, eagles ~~always~~ fly low over the surface, just as Buzzards, Harriers, and Sparrow Hawks do.

I have seen a domestic cock, after uttering a scream, which brought all the hens around him, stand with upstretched neck and head inclined to one side, and gaze intently into the clear sky, or looking into which, I, after a little search, perceived an Eagle floating and wheeling at a great height.

at the height of only a few hundred feet above the eminences, if their object be to discover large animals, as deer, and if to search for small, always

Young.—When fully fledged the young bird has the bill brownish-black, paler at the base; the cere greenish-yellow; the iris dark brown; the feet lemon-yellow; the claws brownish-black. The feathers of the head and hind-neck are brown, tipped with light yellowish-brown; the back and breast deep brown, the wing-coverts and inner secondaries paler and tipped with whitish; the feathers of the inner and fore part of the tibia, and those of the tarsus, white at the end; the lower tail-coverts white, with a brown spot; the primaries brownish-black, the secondaries dark brown, with their bases white, mottled with greyish-brown; the tail white, with a broad terminal band of brownish-black. The white bases of the feathers appear in patches on the back and hind-neck.

A newly fledged bird from Norway, remarkably beautiful on account of the mottled state of its plumage, I may with propriety describe, as the precise markings of the young of this family have never been accurately given by any author. The horny part of the bill is blackish-brown, yellowish at the base, the cere and basal margins yellow; the feet yellow, the claws deep black. The down and bases of all the feathers pure white. The forehead is brown, the hind-head and back part of the neck dull yellowish-brown; the plumage of the other parts is dark chocolate, but the white is apparent everywhere, unless on the smaller wing-coverts; the feathers on the edge of the wing yellowish-brown, with a central dusky streak. The basal half of the quills and larger wing-coverts being white, that colour is very conspicuous on the wing; the terminal portion of the quills brownish-black, of which dots and small spots encroach on the white part. The tail is white, with a terminal band of brownish-black, four inches in breadth on the outer webs of the outer, and three on those of the inner feathers, being narrower on the inner webs. The large tufty feathers on the abdomen, as well as the inner tibial and tarsal feathers, are white; the lower tail-coverts greyish-white, with a light brown patch at the end.

Progress toward Maturity.—A Scottish male of the first year examined in the end of December was as follows. The soft skin at the base of the bill, the cere and feet rich pure yellow; the

bill and claws light blue at the base, brownish-black at the end. The basal or concealed part of the whole plumage, as well as the down, is pure white. The preocular region whitish, the bristles black; the head and hind-neck umber-brown, each feather tipped with light yellowish-brown; the general colour of the plumage is a rich deep brown, on the back and scapulars highly glossed with purple. The primary quills, their coverts and alula, deep black towards the end; the secondary quills deep brown, obscurely mottled with greyish; the tail white, with a broad brownish-black terminal band, on the middle feathers three, on the lateral four inches in breadth; upper tail-coverts similar, having only a terminal band of brown. All the feathers are more or less tipped with whitish or pale brown; and on the short feathers of the legs the white tips are so large as to form the principal colour; the white base of the dorsal feathers appears here and there, and that of the primary quills is also apparent.

As the bird advances in age, the light yellowish-brown of the head and hind-neck assumes a richer tint, sometimes approaching to chestnut; the short feathers of the legs acquire a similar tint; the deep brown of the body undergoes little change, but the wing-coverts become of a lighter hue and the breast often more brown; the whitish tips disappear on the body; the white of the basal portion of all the feathers and quills gradually diminishes from the enlargement of the brown, so that the white patches on the back and hind-neck disappear; the quills ultimately being brownish-grey, irregularly banded or mottled with darker; and the tail becoming banded and mottled with dark brown on a brownish-grey ground, while its upper coverts are deep brown, and the lower chestnut.

After examining about fifty individuals, alive, newly killed, or preserved, I think that the plumage is darker in early than in old age, many young birds having the back and breast blackish-brown, and the ends of the quills deep black; but the yellowish-brown parts become of a richer tint. The diminution of the basal white of the feathers is perfectly analogous to what we observe in the Sea-Eagle, in which however the tail ultimately becomes white, the change commencing near the tip.

Genus I. HALIAËTUS. SEA-EAGLE.

Bill nearly as long as the head, very high, at the base of nearly the same breadth and height, gradually compressed; upper mandible with the cere large and bare, the dorsal line nearly straight along the cere, then decurved in the fourth of a circle, at the end slightly incurvate, the ridge along the cere broad and flattened, in the rest of its extent convex, gradually narrowed to the tip, the sides flattish and nearly erect, the edges thin, nearly straight, with a slight festoon anterior to the cere, then decurved, the tip elongated, trigonal, acute, concave beneath; lower mandible scarcely a third of the height of the upper, its angle long, of moderate width, and rounded, the edges soft, obtuse, and straight for more than half their length, then sharp and gradually decurved, the ridge broad and convex, the sides ascending and convex, the tip rounded and thin-edged.

Mouth wide, palate flat, with two longitudinal prominent lines; upper mandible slightly concave within, the lower more deeply concave, posterior aperture of the nares oblong, with an anterior slit. Tongue fleshy, deeply emarginate and papillate at the base, with one of the lateral papillæ large, concave above, the sides nearly parallel, the tip rounded. Œsophagus very wide, with a very large crop lying toward the right side. A broad belt of proventricular glands. Stomach large or of moderate size, roundish, its muscular coat thin and composed of a single series of fasciculi; the tendinous spaces round and thin. The intestine very long and narrow; the duodenum extremely elongated, and instead of forming a single loop as usual, disposed into a coil of several folds, in which respect it differs from that of any other British genus. The cœca are very small, the cloaca very large and globular. Plate XX, Fig. 1.

Nostrils oblong, oblique, sub-basal, near the ridge, in the

fore part of the cere. Eyes large, with projecting superciliary ridge; eyelids edged with bristly feathers. Aperture of ear rather large, and roundish.

The body is robust and compact, of great breadth anteriorly; the neck of moderate length; the head large, roundish, ovate. The feet short, very strong; the tarsus very short, feathered halfway down, scaly in the rest of its extent, with anterior and posterior scutella, the latter small. The toes are very stout; the first and second about equal, the fourth a little longer than the second, the third or middle toe much longer, all scaly at the base, and scutellate toward the end. Claws very large, curved in the third of a circle, higher than broad, flattened on the sides, broadly convex above, concave and marginate beneath, acute; the first and second largest, the third with an edge and a broad groove on the inner side.

Plumage compact and imbricated. The space from the eye to the cere thinly covered with very small bristle-feathers. On the head and neck the feathers are lanceolate and acuminate; on the upper parts broadly ovate and rather obtuse; on the lower parts ovate, on the outer part of the tibia elongated, on the tarsus small and soft. In the furcular region, the feathers do not meet, but leave a space covered with very soft down. Wings very long, broad, and rounded, with thirty quills, of which the first is a little shorter than the seventh, the second than the fifth, the third and fourth longest; the first seven with the outer web attenuated, and the first five with the inner web emarginate; the primaries pointed, the secondaries very broad, and broadly obtuse, with a minute tip. Tail of moderate length, extending considerably beyond the tips of the wings, broad, rounded, of twelve very broad feathers.

This genus is composed of birds of large size, which frequent the shores of the sea, lakes, and rivers, nestling in rocks or on high trees, and feeding on carrion, fish, small quadrupeds and reptiles. They are less bold and vigorous than the true Eagles, somewhat sluggish, but yet possessed of great strength, and when impelled by hunger they attack animals of considerable size. Fish forms a great portion of their diet,

and it is curious to observe how in this genus, as in the Ospreys, the intestine becomes elongated and attenuated, like that of the ichthyophagous Feræ. The singular curvature of the duodenum, Plate XX, Fig. 1, *i*, which I have found in the White-headed Sea-Eagle of America, as well as in our own, affords a character by which the genus Haliaëtus is distinguished from Aquila, which moreover has a very different physiognomy, and is intimately allied to Buteo.

The accompanying figure represents the foot of Haliaëtus Albicilla, and may be compared with that of Aquila Chrysaëtus, given in p. 203, when it will be seen that the two genera are as well distinguished by their feet as by the form of the bill.

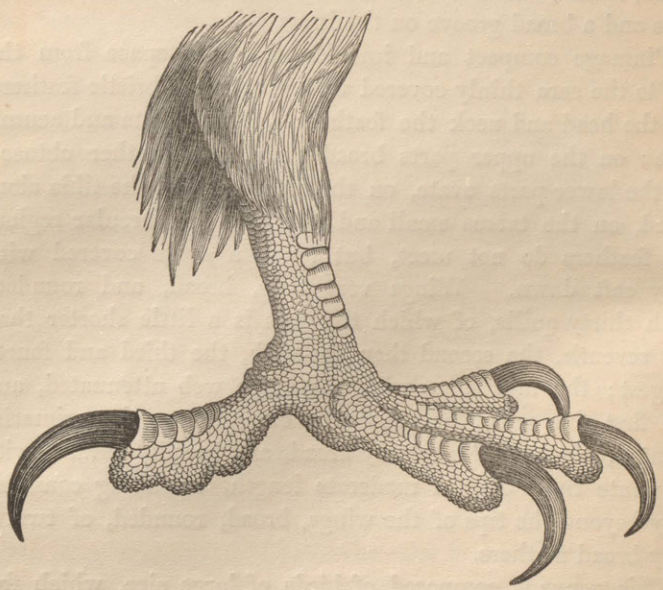


Fig. 216.

I. HALIAËTUS ALBICILLA. THE WHITE-TAILED SEA-EAGLE.

CINEREOUS EAGLE. GREY EAGLE. SEA-EAGLE. ERNE. OSPREY. IOLAIR BHUIDHE. IOLAIR RIAMHACH.

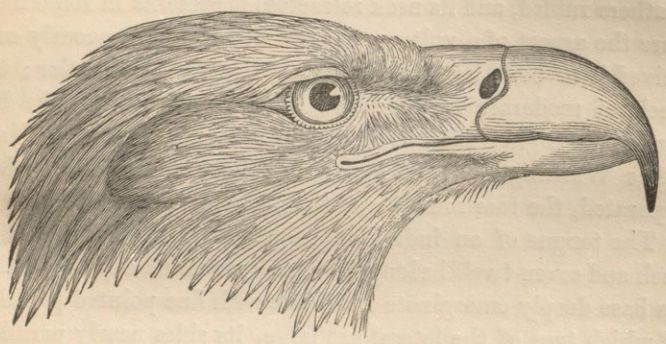


Fig. 217.

Vultur Albicilla. Linn. Syst. Nat. I. 123. Adult.
Falco Ossifragus. Linn. Syst. Nat. I. 124. Young.
Falco Albicilla. Lath. Ind. Orn. I. 9. Adult.
Falco Ossifragus. Lath. Ind. Orn. I. 12. Young.
Cinereous Eagle. Mont. Orn. Dict. Adult.
Sea Eagle. Mont. Orn. Dict. Young.
Aigle Pygargue. Falco Albicilla. Temm. Man. d'Orn. I. 49.
Cinereous Sea-Eagle. Haliaëtus Albicilla. Selb. Illustr. I. 18.
Aquila Albicilla. Cinereous Eagle. Jen. Brit. Vert. An. 80.

Adult with the bill, feet, and irides yellow; the plumage of the head, neck, and part of the back and breast, greyish-yellow, or pale brown, tinged with grey; of the hind part of the back darker, the abdomen and legs chocolate brown; the quills brownish-black, the tail white. Young with the bill brownish-black, the irides brown, the feet yellow; the plumage pale brown, with elongated dark brown spots; the tail dark brown, variegated with white.

Male.—The White-tailed Sea-Eagle, the only species of its genus that occurs in Britain, and the largest of our rapacious birds, not excepting the Golden Eagle, although inferior in grace and activity to the smaller species of this family, exhibits, when excited, an appearance of power and ferocity calculated to inspire that kind of respect which we pay to men endowed with similar qualities. In its ordinary attitude, with its body inclined, its large wings hanging by its side, with the secondary quills and coverts projecting over the primaries, its feathers ruffled, and its neck retracted, it presents in some measure the aspect of a vulture, which Linnæus erroneously conceived it to be. Its body is large, firm, and muscular; the neck of moderate length; the head broadly ovate, the bill larger and higher than in any species known, excepting Haliaëtus Washingtoni; the legs exceedingly strong, and widely separated, the toes robust, and the claws very formidable.

The tongue of an individual supplied by Mr Carfrae, is an inch and seven-twelfths long, its average breadth eight-twelfths, its base deeply emarginate and beset with fine pointed papillæ, of which two of the lateral are large, its sides nearly parallel, its upper surface concave, its tip rounded. The œsophagus is twelve inches long, at the middle and lower part of the neck dilated into an enormous crop, three inches in width, then contracted to an inch and a quarter, and again gradually enlarged to two inches and a quarter. The stomach is round, a little compressed, two inches and a quarter in diameter; its walls extremely thin, the muscular layer being composed of a single series of parallel fasciculi; the epithelium thin, soft, and smooth; the tendinous spaces round, very thin, and eight-twelfths in diameter. The intestine is very long and slender, its entire length being twelve feet three inches, its width at the commencement four-twelfths, the widest part five-twelfths, and the narrowest only two-twelfths. The duodenum, instead of forming a simple loop, as usual, is greatly elongated, so as to measure twenty inches, and is bent upon itself from left to right, presenting the appearance of a coil of rope. The cœcal appendages are slight knobs, three-twelfths in length. The rectum, which is five inches long, has a width of ten-twelfths,

and dilates into a globular cloaca, two and a half inches in diameter, into which it opens by an aperture of half an inch. The lobes of the liver are very large, the right being three inches and a half in length, the left three inches; the gall-bladder elliptical, and an inch in length. Plate XX, Fig. 1.

The trachea is ten inches long, considerably flattened, somewhat tapering, its breadth ten-twelfths at the commencement, at the middle seven and a half twelfths, at the lowest part six and a half. The rings are all cartilaginous, a hundred and twenty-five in number; the bronchi wide, short, with twenty half-rings. The lateral muscles are moderate, the sterno-tracheal very strong, and there is a single pair of inferior laryngeal muscles going to the last dimidiate ring of the trachea.

The space between the bill and the eye is thinly covered with bristle-like feathers, which are downy at the base. The feathers on the head are of moderate length, those on the neck long, all lanceolate and acuminate, with loose margins; on the upper parts of the body they are broadly ovate and acute, on the lower ovate and rather obtuse. The wings, which when closed reach nearly to the end of the tail, have thirty quills, of which the first is a little shorter than the seventh, the second about the same length as the fifth, the third and fourth longest. The tail is of moderate length, broad, and much rounded, the lateral feathers being three inches shorter than the middle.

The cere and bill are pale yellow; the iris bright yellow; the tarsi and toes gamboge, the claws black, with a tinge of greyish-blue. The plumage of the head, neck, fore part of the back and breast, with the upper wing-coverts greyish-yellow, the feathers all greyish-brown at the base; of the other parts greyish-brown, edged with yellowish-grey; the scapulars and feathers of the rump glossed with purple; those of the abdomen, tibiæ, and subcaudal region, inclining to chocolate brown; the quills and alular feathers brownish-black, with a tinge of grey, the inner secondaries inclining to greyish-brown; the shafts of all white toward the base; the lower surface of the quills and the large coverts tinged with greyish blue. The upper tail-coverts and the tail are white (generally freckled with dusky grey at the base). The down on the breast is pale grey, that on the sides darker.

Length to end of tail 36 inches; extent of wings 72; bill along the ridge $3\frac{5}{12}$, along the edge of lower mandible 3, its height $1\frac{5}{12}$; wing from flexure 24; tail $11\frac{1}{2}$; tarsus 4; first toe $1\frac{4}{12}$, its claw $2\frac{2}{12}$; second toe $1\frac{7}{12}$, its claw $2\frac{2}{12}$; third toe 3, its claw $1\frac{8}{12}$; fourth toe $2\frac{1}{12}$, its claw $1\frac{7}{12}$.

Female.—The female does not differ from the male in colour, and her superiority in size is often not very remarkable.

Length to end of tail 40 inches; extent of wings 80; bill along the ridge $3\frac{11}{12}$, along the edge of lower mandible $3\frac{4}{12}$, its height $1\frac{8}{12}$; wing from flexure $27\frac{1}{2}$; tail 12; tarsus $4\frac{1}{2}$; first toe $1\frac{1}{2}$, its claw $2\frac{1}{4}$; second toe $1\frac{9}{12}$, its claw $2\frac{4}{12}$; third toe $3\frac{1}{12}$, its claw $1\frac{9}{12}$; fourth toe $1\frac{8}{12}$, its claw $1\frac{5}{12}$.

Variations.—In adult individuals the colouring varies in a considerable degree, older birds having the tints lighter. In some instances the plumage is of a purplish-grey, or bluish-grey, but, I think, never in the wild state. Great differences are also observed in size. Thus I have examined one that measured seven feet four inches between the tips of the wings, and saw in South Uist the skin of one which measured nine feet, while others do not much exceed six.

The variations which I have noticed in the digestive organs of this species will be best exhibited in a tabular form:

	M.	M.	M.	M.	F.	F.
Tongue in length.....	$\frac{8}{12}$	$1\frac{7}{12}$	—	—	—	—
Œsophagus in length.	15	12	12	12	$12\frac{1}{2}$	15
Width of crop	$4\frac{1}{2}$	3	3	—	$3\frac{1}{2}$	4
Diameter of stomach.	$1\frac{9}{12}$	$2\frac{1}{4}$	2	—	$2\frac{1}{2}$	2
Length of intestine ...	180	147	143	170	—	120
Length of duodenum.	24	20	21	—	—	—
Greatest width.....	$\frac{4\frac{1}{2}}{12}$	$\frac{5}{12}$	$\frac{5}{12}$	$\frac{3}{12}$	$\frac{5}{12}$	$\frac{1}{4}$
Smallest width	$\frac{2}{12}$	$\frac{2}{12}$	$\frac{3}{12}$	$\frac{2}{12}$	$\frac{2}{12}$	$\frac{1\frac{1}{2}}{12}$
Length of cœca.....	$\frac{4}{12}$	$\frac{3}{12}$	$\frac{3}{12}$	—	$\frac{3}{12}$	$\frac{4}{12}$
Length of rectum.....	6	5	5	—	5	—
Cloaca in width.....	2	$2\frac{1}{2}$	2	—	—	2

On comparing these measurements with those of the Golden Eagle, differences will be seen sufficient to indicate more important distinctions than those derived from the form of the bill.

The tracheæ of several individuals were as follows:

	M.	M.	F.	F.
Length	10	10	10	$10\frac{1}{2}$
Width above.....	$\frac{10}{12}$	$\frac{10}{12}$	$\frac{10}{12}$	$\frac{10}{12}$
Width below.....	$\frac{6\frac{1}{2}}{12}$	$\frac{6}{12}$	$\frac{6\frac{1}{2}}{12}$	$\frac{6}{12}$
Rings.....	125	120	135	137
Bronchial rings.....	20	18	16	16

Similar differences are found in the number of scutella :—

	Adult.							Young.							
Anterior tarsal	7	–	5	6	7	7	3	3	8	6	6	7	6	7	4
Posterior tarsal	0	–	1	0	7	3	0	0	4	0	16	10	0	10	0
Hind toe	3	3	3	2	4	5	4	4	4	4	4	4	4	5	4
Second toe.....	4	3	3	4	4	5	4	4	4	5	4	5	5	4	4
Third toe	12	12	14	11	12	12	11	11	12	12	13	13	14	13	12
Fourth toe	6	6	6	7	4	7	6	6	7	7	7	7	6	7	5

These differences will serve to shew what degree of dependence may be had on the scutella as affording specific distinctions.

Change of Plumage.—The moult is not completed until the end of autumn, when the feathers are of a deeper tint than in summer. The change is very gradual, and new feathers may be seen at any period, as in the Golden Eagle.

Habits.—The White-tailed Sea-Eagle usually chooses for its retreat the shelf of some lofty precipice overhanging the sea, and there in fancied security forms its nest, and reposes at night. Individuals have been known to remain attached to the same spot for many years, nor does it appear that this bird ever relinquishes its residence to its young, but drives them off to find a

habitation for themselves. For this reason, most of the wandering individuals that have been shot at great distances from the breeding places, have been young or immature birds. The male and female remain together through the winter, when they generally search for food in company. Toward the middle of spring, they begin to construct their nest, which is of great size, being about five feet in diameter, flat, and composed of sticks, twigs, heath, often dried sea-weeds, as well as tufts of grass, wool, and other materials. The eggs, two in number, rarely one, are about the size of those of a domestic goose, but broader, pure white, or yellowish-white, generally with some pale red dots or spots chiefly at the larger end. From never finding the eggs exposed, I have thought that the male sits upon them in the absence of the female, although this is mere conjecture, and I am not aware of any positive observations that have been made on the subject. The young make their appearance about the beginning of June, and are then covered with down of a greyish-white colour. They are plentifully supplied with food, and grow rapidly, but do not leave the nest until the middle of August, when they are enticed abroad by their parents, who continue to supply them with food for many days.

During the breeding season, these birds, in places where they are numerous, are subjected to much annoyance, and frequently fall victims to the vengeance of shepherds and farmers. There are few places that can be selected by them altogether beyond the reach of man; for even when the nest has been built on the face of a precipice, it may usually be got at by letting down a person on a rope, or even by creeping along some crevice or sheep-path, or it may be within shot from the base of the rocks, or some projecting crag. I have been within three yards of an eagle upon her nest, and yet, from the peculiar nature of the spot, was unable to shoot it, and indeed hardly escaped with my life, for, after the bird had flown off, and the excitement of hope was over, I began to consider how I should return, and finding myself on the brink of a perpendicular rock five hundred feet high, with an abrupt slope above me, and a dangerous slanting descent of several hundred yards to accom-

plish, I sat down in despair, and might have remained there for hours, had not a shepherd opportunely come to my aid. Sometimes the breeding place is easily accessible, being in a small rock by the side of a lake, and I have seen one that could have been reached with a fishing-rod. On a flat islet in a small lake in Harris, one of the Hebrides, a pair of these birds bred for many years, although there are lofty crags in the neighbourhood.

In these islands, where the Sea-Eagles are still numerous, the nests are sometimes destroyed by letting down into them a

at p. 227

It is a remarkable circumstance that Eagles are little apt to commit depredations in places not remote from their nest, lambs and poultry in its vicinity being generally safe. Of this I have often been assured by the people in the Hebrides, and a similar statement occurs in "Martin's description of the Western Islands" p. 26. In speaking of one of the Shiant Isles on the coast of Lewis, he says:- "I saw a couple of Eagles here. The natives told me that these Eagles would never suffer any of their kind to live there but themselves, and that they drove away their young ones as soon as they were able to fly, and they told me likewise that those Eagles are so careful of the peace of their abode, that they never yet killed any Sheep or Lamb in the Island, tho' the bones of Lambs, of Fawns, and Wild-Fowls are frequently found in and about their nests, so that they make their purchase in the opposite Islands; the nearest of which is a League distant." I have known several instances in which the same pair, or at least a single pair of White-tailed Sea-Eagles, bred many years successively in the same rock, with-

braxy commits its ravages, or in the end of spring, when severe weather often causes the death of the young lambs, they are not uncommonly seen hovering about. Their food consists of carrion of every description, for which they search the moors and pastures, stranded fish, young sea-birds, and small quadrupeds. Their sight must be keen, like that of other birds of prey, but in looking for food they do not soar to a vast elevation, as has been alleged by many, but fly at the height of a few hundred yards, sweeping along the hill sides with a steady

habitation for themselves. For this reason, most of the wandering individuals that have been shot at great distances from the breeding places, have been young or immature birds. The male and female remain together through the winter, when they generally search for food in company. Toward the middle of spring, they begin to construct their nest, which is of great size, being about five feet in diameter, flat, and composed of sticks, twigs, heath, often dried sea-weeds, as well as tufts of grass, wool, and other materials. The eggs, two in number, rarely one, are about the size of those of a domestic goose, but broader, pure white, or yellowish-white, generally with some

out permitting their offspring to resort to it. The small Island of Shelay, the promontory of Toe Head, and the Rock of Tarcle, in Harris, contained single nests for many years.

of the rocks, or some projecting crag. I have been within three yards of an eagle upon her nest, and yet, from the peculiar nature of the spot, was unable to shoot it, and indeed hardly escaped with my life, for, after the bird had flown off, and the excitement of hope was over, I began to consider how I should return, and finding myself on the brink of a perpendicular rock five hundred feet high, with an abrupt slope above me, and a dangerous slanting descent of several hundred yards to accom-

plish, I sat down in despair, and might have remained there for hours, had not a shepherd opportunely come to my aid. Sometimes the breeding place is easily accessible, being in a small rock by the side of a lake, and I have seen one that could have been reached with a fishing-rod. On a flat islet in a small lake in Harris, one of the Hebrides, a pair of these birds bred for many years, although there are lofty crags in the neighbourhood.

In these islands, where the Sea-Eagles are still numerous, the nests are sometimes destroyed by letting down into them a bundle of heath and straw inclosing a burning peat; or an adventurous person is lowered in the same manner. On such occasions the parent birds, although they evince the greatest distress, seldom attempt to molest their enemy, but fly in circles at a distance, giving expression to their rage by loud screams, and frequently stretching out their feet and expanding their talons, as if to intimidate him. Yet it appears that they will sometimes hazard an attack, for in the island of Lewis I was told of two such instances, a pair having assaulted a woman who was descending a rock on her way home from the moors, and inflicted some severe scratches on her neck and shoulders, and another individual having unexpectedly struck with its wing a man who was watching its arrival on the edge of a cliff overhanging its nest.

When the breeding season is over, the young disperse, and although these birds are not of social habits, several individuals may often be seen at no great distance traversing the hills or shores, when there is plunder to be obtained. At seasons of mortality among sheep, as in the end of autumn, when the braxy commits its ravages, or in the end of spring, when severe weather often causes the death of the young lambs, they are not uncommonly seen hovering about. Their food consists of carrion of every description, for which they search the moors and pastures, stranded fish, young sea-birds, and small quadrupeds. Their sight must be keen, like that of other birds of prey, but in looking for food they do not soar to a vast elevation, as has been alleged by many, but fly at the height of a few hundred yards, sweeping along the hill sides with a steady

motion, or winding in curves with outspread wings. I have often seen them far out at sea, hovering and sailing in this manner, and several persons have told me that they sometimes clutch up fishes that happen to come to the surface. They may also occasionally be observed watching on the banks of a lake or river, and attacking the salmon or trouts when they come into shallow water. That they fare well is evinced by the abundance of provision which they bring to their young; but their courage and address do not seem to be equal to their powers, for, unless pressed by famine, they scarcely venture to molest an animal larger than a hare. When an otter has caught a fish, and is eating it on some rock, an eagle has been seen patiently waiting its departure, in order to obtain the refuse. Grouse are sometimes destroyed by this species, and instances have been known of its carrying off a domestic fowl, or a duck, that has straggled to a distance from the house. But the Sea-Eagle has more of the Vulture than of the Falcon in its character, and at all times would be well content with mere carrion.

It is no easy matter to approach an Eagle so near as to obtain a distinct view of it, and yet I once crept to within fifteen yards of one, and, after all, missed it. Once too, in the mist, on the top of a high hill, another swept close over my head. At a distance, and with the aid of a glass, one may often in the Hebrides observe their attitudes, as they repose on some pinnacle or shelf, basking in the sun, with partially expanded wings and tail, somewhat in the manner of Cormorants. On a level surface, such as an extensive sand, where I have often seen them, they stand with the body inclined forwards, the wings gathered up, and the head elevated. Owing to their great weight, and the vast size of their wings, they rise from such a place with difficulty, first throwing themselves forward, and then spreading out and flapping their wings, so as to strike their points on the ground.

But the Sea-Eagle is now on wing, and as he gradually mounts in wide curves, sailing at invervals, you cannot fail to gaze on him with delight. With his feet concealed among the feathers of the abdomen, his head drawn close to his shoulders,

and his magnificent wings spread out to their full extent, and even seeming to curve upwards at the points, he sweeps along the sides of the hills, advancing with apparently little effort, and, should he spy a carcase, hovers over it in short curves until satisfied as to his security should he alight upon it. Very frequently he is led to the spot by seeing the Raven there, for that bird is more quick-sighted than even the Eagle. On alighting, he stands for a time, then clumsily leaps up to the carcase, perches upon it, and begins to tear open the abdomen, the eyes having already been removed by the Crows. Should a dog come up, the eagle retires to a short distance, or sweeps overhead, making a pretence of pouncing on the intruder, who, while he allays his hunger, keeps an eye on the foe, and snarls when threatened with a visitation.

A beautiful sight it is, on some sunny day, when two Eagles are seen floating lazily in the blue sky, far above the tops of the brown hills. Slowly and majestically, with wide-spread wings, they sail in wide circles, gradually ascending, until at length you can scarcely perceive them. They may continue this exercise for more than an hour, and should you enquire the object of it, you may be satisfied that it is not for the purpose of spying their prey, for no one ever saw an Eagle stoop from such a height. On ordinary occasions, when proceeding from one place to another, they fly in the usual manner, by slowly repeated flaps. In the breeding season, should two males encounter each other, they sometimes fight in the air, throwing themselves into singular postures, and screaming loudly. The cry of this species is so shrill, that in calm weather one may hear it at the distance of a mile, and it often emits a kind of clear yelp, which resembles the syllable *klick*, *klick*, *klick*, or *queek*, *queek*, *queek*, and which seems to be the expression of anger or impatience.

In its own class, the Sea-Eagle has few enemies capable of injuring it, the Golden Eagle being the only bird powerful enough to contend with it effectually; but it is often molested by the Raven, the larger Gulls, and sometimes by Hawks, especially when it happens to come near their nests. On this subject, Mr Dunn has the following statement:—"I

once saw, while shooting on Rona's Hill, a pair of Skua Gulls chase and completely beat off a large Eagle: the Gulls struck at him several times, and at each stroke he screamed loudly, but never offered to return the assault. He was sailing along close to the steep part of the cliffs near the breeding-places of these Gulls, and was most probably looking out for a repast, which he would doubtless have secured had he not received the hint that his company could be dispensed with. I have also seen from ten to fifteen of the Arctic Gulls attack an Eagle and beat him from their habitations." From the attacks of quadrupeds it is perfectly secure, and if a weasel ever destroyed an eagle, the story has been repeated so often by travellers and other romancers, that no credit can now be attached to it. Its great enemy is man, who destroys its nest, ~~breaks~~ its eggs, kills or carries off its young, traps it in various ways, or by lying concealed in a covered pit or hut, shoots it as it feeds on the carcase laid out to attract it.

Owing to the persecution to which it is thus subjected, it has been almost entirely extirpated in England. In the southern division of Scotland, or from the borders to the Friths of Forth and Clyde, it is probable that half a dozen pairs are not now to be found. In the middle division, it is still rare; but in the northern, and especially in the Hebrides, it is in many places not uncommon. Stragglers, however, especially young birds, are now and then killed in all parts of the country, even in the south of England; and, although its numbers have thus been reduced, it is probable that it will never be entirely extirpated. It does not appear to be necessarily or essentially maritime, but rather to frequent the sea-coast because of the facility of finding secure resting-places on the cliffs; for it is met with in the interior, even in Braemar and about Lochlagan. But in such places it is less frequent than the Golden Eagle, which, on the other hand, also breeds on maritime rocks. In Orkney, as I am informed by Mr Forbes of South Ronaldshay, it breeds on several of the headlands; and Dr Laurence Edmondston has favoured me with the following account of it as observed in Shetland.

"This, I believe, is the only species of Eagle that breeds in

Shetland, where however it is rare. Perhaps the whole of the islands could not produce more than a dozen of pairs. It is generally, unless at the breeding season, found in single individuals. It feeds chiefly on rabbits and sea birds, especially the young of the larger gulls; but it does not neglect carrion, if it is to be had, in lonely places, and before it becomes very putrescent. It is not very destructive to sheep. In spring, it often sweeps along the cottages very early in the morning, to the fatal experience of the poultry. During summer and harvest, large flocks of geese pasture among the most retired hills, without any protection, and in the vicinity of its favourite haunts, yet its depredations on them are rare. This abstemiousness must not, however, be taken for amiable self-denial, but for a most uneagle-like pusillanimity. The wing of the gander, which not unfrequently is uplifted in defence of his young, has a moral if not a physical power, which the robber Erne seems to quail under.

"Occasionally, during warm weather, skate and holibut bask on the surface of the water, and the Eagle pounces on them; but several instances have occurred of this aquatic hunt being fatal to him. Indeed, I am inclined to think that this habit is one chief way in which his numbers are kept down. If the fish is not so large as to be able immediately to drag him under water, he elevates his wings, and in this way, if the wind happens to be blowing on the land, he often manages to reach it in safety. An instance of this once occurred to my grandfather, who, concealing himself until the bird had thus sailed ashore, seized both him and his victim, a small holibut.

"It is not to be supposed, whatever the natives may say, that the Eagle in this case, regards his wings as sails. He keeps them as long as he can in the air, because this is their natural element, and because he, finding he has 'caught a Tartar,' wishes to disengage himself. And, whatever be the intention of spreading his canvass to the breeze, it as often destroys as saves him by carrying him from as to the land. After reaching the shore, the first thing he does is to extricate his claws with his beak, and by repeatedly stroking his feathers to dry

himself sufficiently for flight, and then, and not before, he feasts on his slippery victim if he perceives the coast clear of danger and detection.

"The account given by Von Buch of the mode in which Eagles in Norway sometimes attack cattle, may be more apparently than really improbable. Granting the fact however, it is not likely that it relates to the Albicilla, a bird by no means remarkable for courage; though, like the wolf, there is no saying to what lengths hunger may impel him. Nor would the attack be probably made with so reasonable and politic a calculation of means as that of throwing dust in the eyes of his victim. A fact however may be very commonplace, while its theory may be marvellous enough. In this way, perhaps, it may be accounted for:—Eagles are numerous in Norway; so are fish. In their attempts to catch them, their plumage may be wetted, and in drying it they may roll themselves, like poultry, in sand or mould, and soon after may be seen to attack the diminutive cattle of these regions, as the Golden Eagle, I believe, sometimes assails deer, by striking at their heads and eyes. And why might not the Erne attack a weak horse or ox, as well as the Raven? or, it may be their habit, like that of Crows and Ravens, during warm weather, especially when annoyed by vermin, or during the moulting season, to wash themselves, and then roll amongst the sand or dry earth.

"He is attacked, or rather molested, by every bird, great or small, when he approaches their nests. Gulls, Lestres, Oyster-catchers, Terns, all repeatedly dash up to him, but yet not daring contact, their clamours, not their blows, being the weapons to which they prudently have recourse, and they thus literally scold him from his propriety, and their territories; for with a very rustic awkwardness, and want of self-possession, he makes his obeisance, and decamps.

"He breeds on the most inaccessible cliffs, remote from the vicinity of other birds, unless it may be a pair of Ravens; lays two eggs, sometimes three, it is said; and generally has two young ones. He is seldom shot, being very circumspect, but if wounded, is very tenacious of life. I have seen one fly a

mile with a musket ball through his body. In the few attempts made to domesticate him here, he has been true to his nature, fierce and ruthless."

In Orkney, according to Mr Low, "this very large species is very often seen, and sometimes surprised on our low shores, feeding on fish, which it has either caught itself, or has been left by the otter. I have often seen it soaring, at a vast height in the air, immediately over a conger or other fish, which has

p. 233.

Sir Robert Sibbald has the following story of the same kind:-
"Retulit mihi D. Mathæus Mackaile Pharmacopœus Aberdonicensis, plurimas esse aquilas in occidentali parte Terræ firmæ Orcadum, quæ Pomona dicitur, et et in Insula Hoia, unamque ex iis infantulum unius anni pannis involutum arripuisse, quem mater tessellas usui biles pro igne alendo momento temporis deposuerat in loco Houton-head dicto, eumque deportasse per quatuor milliaria passuum ad Hoiam; qua re ex matris ejulatibus cognita, quatuor viri illuc in navicula projecti sunt, et scientes ubi nidus esset, infantulum illorum et intectum deprehenderunt."

person. In this state it may be fed with meat, offal, or fish. It readily clutches any living animal of small size, and should a piece of meat, a rat, or other article of food be thrown to it, it will often catch it in its mouth, or with one of its feet. On comparing its cry when in this state with that of the Golden Eagle, I have found it louder and shriller. The trachea of both is unossified and very wide, but that of the Sea-Eagle is nearly double the size of that of the other.

an Eagle came in the meantime, and carried him away in its talons as far as the South side of the Loch, and there laying him on the ground, some People that were herding Sheep there perceiv'd it, and hearing the Infant cry, ran immediately to its rescue, and by good Providence found him untouch'd by the Eagle and carried him home to his Mother. He is still living in that Parish, and by reason of this Accident is distinguished among his Neighbours by the Sirname of Eagle."-p. 299.
Sir Robert

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Like the story of the weasel that killed the eagle by fastening on its throat, which has been twenty times repeated, and every time told as new, that of eagles carrying off children has been appropriated in almost every district in the Highlands. Perhaps the story of its sailing to land with a fish in its claws, may be classed with the rest. Such an occurrence undoubtedly took place, as related above, but who has seen it repeated? A weasel too may have killed an eagle, and an eagle may have killed or carried off a child; but when and where has this been done a second time?

I have never seen this bird truly domesticated; but individuals are frequently kept chained or caged, and some have lived in captivity to a very old age. When thus confined, it loses its timidity, and becomes savage and ferocious, so as readily to attack a dog, a child, or sometimes even a grown person. In this state it may be fed with meat, offal, or fish. It readily clutches any living animal of small size, and should a piece of meat, a rat, or other article of food be thrown to it, it will often catch it in its mouth, or with one of its feet. On comparing its cry when in this state with that of the Golden Eagle, I have found it louder and shriller. The trachea of both is unossified and very wide, but that of the Sea-Eagle is nearly double the size of that of the other.

The first apparently authentic account of the abduction of a child by an eagle that I have met with is given by Martin, in his Description of the Western Islands of Scotland-1748.—I forgot to give an account of a singular Providence that happened to a native of the Isle of Skye, called Neil, who when an infant was kept by his Mother in the Field, not far from the House on the North side of Loch Portree, an Eagle came in the meantime, and carried him away as far as the South side of the Loch, and there laying him on the ground, some People that were herding Sheep there perceived it, and hearing the Infant cry, ran immediately to its rescue, and by good Providence found him untouch'd by the Eagle, and carried him home to his Mother. He is still living in that Parish, and by reason of this Accident in his Infancy is distinguished among his Neighbours by the Sirname of Eagle."—p. 299.

Sir Robert

Young.—The descriptions generally given of the young of this bird seem to me to be hypothetical rather than derived from strict observation. I have been very fortunate however in obtaining in the autumn of 1839 an individual not quite fledged, the quills and tail-feathers not having attained their full length. The down on all parts is light-grey, on the legs intermixed with slender white tufts. The bill is brownish-black, the base of the lower mandible yellow, the cere greenish-yellow; the feet yellow, the claws black. The bases of all the feathers are brownish-white, their middle parts light reddish-brown, their tips only blackish-brown. The head and nape are dark brown, each feather with a minute brownish-white spot on the tip. On the middle of the back and on the wings light reddish-brown is the prevalent colour, the black tips of comparatively small extent; on the hind part of the back there is much white, that colour extending farther from the base. The quills and larger wing-coverts are blackish-brown, with a tinge of grey; the tail-feathers brownish-white in the centre, black toward the margins, with irregular white dots. The lower parts are of the same colours as the back, or are pale reddish-brown, marked with longitudinal streaks and spots of dark brown; the lower wing-coverts brown, the tail-coverts white, with light brown tips.

Progress toward Maturity.—In the second year the young exhibit little difference, being however of a darker tint on the back and wings. An individual at this age has the bill brownish-black, tinged with blue, its base and the cere greenish-yellow; the iris hazel-brown; the feet gamboge, the claws brownish-black. The head and nape are deep brown; the base of all the feathers on the upper parts is white; on the hind-neck and fore part of the back that colour, tinged with yellowish-brown, prevails, a lanceolate or obovate deep brown spot being on each feather toward the end; on the middle of the back the brown prevails, on the hind part white, and the rump and upper tail-coverts are light-brown, tipped with darker. The scapulars are dark-brown, with a purplish tinge; the wing-coverts dark-brown at the end, but most of the larger pale-brown in the greater part of their extent; the quills

black, with a purplish-grey tinge, the secondaries gradually becoming more brown, and all faintly variegated with light grey and brown on the inner webs. The tail is brownish-black, with a tinge of grey, and more or less finely mottled with whitish. The lower parts may be described as brownish-white, longitudinally streaked with dark-brown, there being a lanceolate patch of the latter on each feather; the lower wing-coverts and feathers of the legs dark-brown; the lower surface of the quills bluish-grey; the lower tail-coverts white, tipped with brown; the down on the breast pure white.

At the first moult the light-brown becomes darker, and the proportion of white is somewhat diminished, unless on the tail, where it is on the contrary increased. The bill and claws are still brownish-black, and the cere greenish-yellow. At each successive moult the bill assumes a lighter tint, passing through shades of brown, until it ultimately becomes pale-yellow; the iris undergoes a similar change; the proportion of white at the base of the feathers diminishes, the dark part enlarges in extent, but becomes paler; the tail-feathers, which are at first freckled with white, or brownish-white, become patched, and finally, at the age of six or seven years, pure white.

In an individual kept by Dr Neill, at Canonmills Cottage, and which was procured by him in the autumn of 1827, in its first plumage, the changes have taken place as above described; but in November 1839, when in perfect condition, the colour of the plumage was purplish-grey, tinged with blue, the edges of the feathers lighter; the anterior parts paler; the quills greyish-black; the tail pure white; the bill and cere pale greyish-yellow, the eye brownish-yellow, and the feet orange. But the beautiful purplish-grey tint of this individual, although sometimes seen in captive eagles, does not occur in those enjoying their freedom.

Remarks.—For the purpose of obtaining some general results by an extended comparison, it may here be well to remark that in this species the bill and iris change from dusky-brown to pale-yellow, and that the plumage, at first white at the base, and dark-brown at the end, gradually loses its white,

while the dark parts become paler and more extended, the final colouring being more uniform. The tail forms no exception, for its basal white also diminishes; but the white which is gradually substituted for the brownish-black, spreads from near the end to the base. The American White-headed Sea-Eagle follows the same rule; but in it, not only the tail, but also the head and neck become white.

This species is said to be rare in the south of Europe, and to be most numerous in the colder parts of the temperate zone, extending as far as Iceland. M. Temminck remarks that "in its migrations, it seems to follow the largest flocks of Bean-Geese, which in autumn betake themselves to the estuaries of rivers;" but from Dr Edmondston's account, this eagle is hardly a match for a goose, which yet is surpassingly strange, when we are told by Mr Audubon that its brother, the White-headed Eagle, captures Swans. Haliaëtus Albicilla has not been found in America, but the American H. leucocephalus is said to breed in Norway.

It is indeed strange that a bird so robust, with a body much larger than that of the Golden Eagle, and with the most formidable bill and talons, should not be distinguished for its feats of daring and strength. The faculties and instincts of animals correspond with their organization, and one cannot help thinking that these enormous claws were given for the purpose of piercing and carrying off nobler game than rabbits and rats. Yet it cannot be denied that this huge bird possesses not a tithe of the spirit of the Peregrine Falcon or Sparrow Hawk; for I have seen it sailing about and screaming, while a person was dangling on a rope above its nest, without so much as making a pretence of attacking him, unless by thrusting out its feet and alternately opening and closing its talons.

Genus III. PANDION. OSPREY.

Body compact, of moderate size; neck of moderate length; head ovate, and not remarkably large.

Bill shorter than the head, stout, as broad as high at the base, gradually compressed: upper mandible with the cere rather narrow, the dorsal outline a little declinate and slightly convex as far as the edge of the cere, then decurved in about the fourth of a circle, the ridge broadly convex at the base, narrowed toward the end, the sides rapidly sloping and convex, the edges sharp, slightly inflected, with a festoon, and a wide sinus at the curvature, the tip deflected, trigonal, very acute; lower mandible with the angle short and rather wide, the dorsal line convex, the back broadly rounded, the sides convex, the edges inflected, decurved toward the end, the tip being obliquely truncate and rounded.

Mouth rather wide; palate flat, with two prominent papillate ridges, and an anterior median ridge. Tongue short, emarginate at the base, with numerous very slender papillæ, one of which on each side is large, its upper surface concave, the tip rounded. Œsophagus very wide, enlarged into a crop of great capacity, then narrowed in entering the thorax, again enlarged at the proventriculus, of which the glands are extremely numerous, very small, oblong, and form a broad continuous belt. Intestine extremely long and slender, forming very numerous convolutions; cœca very short; cloaca very large and globular. Plate XXI, Fig. 1.

Nostrils oblong, oblique, lateral. Eyes of moderate size, without projecting superciliary ridge; eyelids edged with bristly feathers. Aperture of ear rather small and roundish. Feet very robust; tibiæ long and muscular; tarsi very short, thick, covered all round with imbricated scales, of which the posterior are smaller, and have the upper angle elevated into

a point; toes thick, strong, free; the fourth versatile and larger than the second; all with a few broad scutella at the end, but in the rest of their extent covered above with imbricated scales, those on the sides and especially on the lower surface, rising into a conical central point; some of them on the inner side of the outer toe being so prominent as to resemble short spines. Claws long, rather slender, well-curved, rounded above and beneath, with the sides flattened, the tip very acute; those of the hind and outer toe largest, that of the middle toe with an inner longitudinal edge, and a flat surface.

Plumage compact. Cere bare above; eyelids feathered; space between the bill and eye sparsely covered with bristly feathers. On the head and neck, the feathers are rather short, narrow, tapering, and compact; on the back broad, rounded, but acuminate; on the breast similar; on the abdomen softer and more elongated; on the tibia short, slender, and rather soft, the outer not elongated as in the Eagles, Buzzards, and most other genera of this family. Wings extremely long, comparatively narrow, rounded, with twenty-eight quills; the third longest, the first longer than the fifth; primary quills tapering and rounded, secondary broad and rounded, tertiary or humeral largely developed. Tail rather long, a little rounded, of twelve broad feathers.

The genus Pandion appears to have a considerable affinity to Haliaëtus, with which it seems to be connected by a group of which Falco Ichthyaëtus of Dr Horsfield is the species best known. The more remarkable peculiarities in the structure of the Osprey, the only species which I have examined internally as well as externally, are: the extreme elongation of the intestine, which toward its lower extremity is not larger then a raven's quill; the inferior convexity of the claws; the want of a tuft of long feathers on the outer side of the tibia; the conical pointed form of the scales on the lower surface and sides of the toes, and the great length of the wings. The flight of this bird is light and buoyant, as well as strong, and accordingly the ridge of the sternum is very elevated, although the body is not large in proportion to the other parts.

Linn.

1. PANDION HALIAËTUS. THE FISHING OSPREY.

FISHING EAGLE. FISH HAWK. BALD BUZZARD. IOLAIR-UISG.



Fig. 218.

Falco Haliaëtus. Linn. Syst. Nat. I. 129.
Falco Haliaëtus. Lath. Ind. Orn. I. 17.
Osprey. Mont. Orn. Dict.
Aigle Balbusard. Falco Haliætus. Temm. Man. d'Orn. I. 47; II. 25.
Osprey. Pandion Haliaëtus. Selb. Illustr. I. 24.
Aquila Haliæëtus. Osprey. Jen. Brit. Vert. An. 81.

Adult with the bill bluish-black, the cere light blue, the feet pale greyish-blue; the plumage above deep umber-brown, the upper part of the head and neck white, the middle of the crown dark brown; a broad band of dark brown on the cheeks and neck; the lower parts white, the neck streaked with brown.

Young with the feathers of the upper parts deep brown, terminally margined with reddish-white.

Male.—The Osprey, which is distinguished from all the British species of this family, by living exclusively on fish,

which it captures for itself, has a form and structure intelligibly correspondent with its habits. It is now so scarce a bird with us that many years may elapse before a person can procure one entire for examination. I have been fortunate however in this respect, having obtained three individuals, two of which were killed in Scotland. The body is proportionally small, but compact and muscular; the pectoral muscles in particular being very large, and the spine of the sternum correspondingly prominent. The head is of moderate size, oblong; the neck rather short, and strong. The bill shorter than the head, very strong, rather higher than broad at the base; the upper mandible with the cere narrow, the dorsal line a little declinate as far as the edge of the cere, then decurved in nearly the third of a circle, the ridge broadly convex, the edges with a slight festoon, the tip deflected, subtrigonal, acute, and at the end perpendicular to the gape-line; the lower mandible with the angle short and rather wide, the back broad, flattened at the base, rounded toward the end, the edge-line arched, the tip obliquely truncate and rounded.

The mouth is of moderate width, its breadth being one inch two twelfths; the palate flat, with two prominent papillate ridges, corresponding to the tongue, and an anterior median ridge. The posterior aperture of the nares oblong, anteriorly linear, slightly papillate on the margins. The tongue is one inch long, sagittate and finely papillate behind, concave above, with the margins rather thick, and the tip rounded, the back horny as usual. The œsophagus is nine and a half inches long, at first little more than an inch in width, but presently dilated into a sac or crop, of which the greatest width is three inches; it then contracts to ten-twelfths of an inch, and enlarges to an inch and a quarter in the proventricular portion. The coats of the œsophagus are very thin; the proventricular glands extremely numerous, very small, and arranged so as to form a continuous belt, an inch in breadth. The stomach is round, a little compressed, two inches in diameter; its muscular coat extremely thin, the inner smooth, without epithelium; the central tendons five-twelfths in breadth. The pylorus has a slightly thickened margin, and three small knobs, terminating

a simicircular elevated line or ridge, and a smaller line proceeding from it. The intestine is extremely elongated, slender, and arranged into numerous convolutions, forming in all forty-six folds. The duodenum forms a loop in the usual manner, and is not convoluted as in the Ichthyaëti. Its widest part measures three twelfths of an inch across, and the narrowest part of the intestine toward the cœca scarcely two-twelfths. The cœca are five inches distant from the rectum, four-twelfths long, three-twelfths in width. The rectum has at first a width of seven-twelfths; and the cloaca is globular, and one and a half inch in diameter. The intestine from the pylorus to the anus measures eleven feet three inches; the œsophagus and stomach eleven and a half inches; the alimentary tube in all twelve feet two and a half inches. The lobes of the liver are less unequal than usual, one being three inches long, the other three twelfths shorter; the gall-bladder oblong, and ten twelfths in length. Plate XXI, Fig. 1.

The nostrils are oblong, oblique, lateral; the eyes of moderate size; the eyelids with three series of short ciliary bristles. There is no projecting lachrymal bone. Aperture of the ear small and circular. The legs are of moderate length, but extremely stout; the tibia long and very muscular; the tarsus very short, very thick, feathered anteriorly halfway down, covered all round with thick scales, of which the anterior are larger and flattened, those behind more prominent, on the outer side conical. The toes are extremely stout, scutellate toward the end, the first having five, the second five, the third four, the fourth four entire scutella; the rest of the upper parts with thick flat scales, the sides and lower surfaces with smaller roundish scales, those on the large pads beneath conical, rigid, and acute. There is a cluster of nine large pointed papillæ on the inner side of the outer toe at the end, and a similar but smaller cluster on the opposite side of the third or middle toe. The hind toe is very short, and has considerable motion laterally; the fourth or outer largest, and reversible so as to form a right angle with the third, which is considerably longer, the second or inner being shorter than the outer. The claws are large, well curved, compressed, rounded above and beneath,

and tapering to a fine point; that of the middle toe with a flat surface and sharp edge on the inner side. Fig. 219.

The plumage is dense and compact. The feathers of the head and neck small, lanceolate, and acuminate; those of the occiput and upper part of the hind-neck rather long, and erectile into a kind of crest; of the fore part of the back large, and ovate, of the hind part small; the scapulars very large and strong; feathers of the breast ovate, of the anterior part of the abdomen longer, so as to cover a flap of large downy feathers, lying over the very dense downy plumage of the abdomen; lower tail-coverts long, compact only at the end. Wings extremely elongated, with ten primaries, eighteen secondaries, and five strong humerals; the outer four quills are abruptly cut out on the inner web, the second, third, and fourth slightly so on the outer; the first a little longer than the fifth, the third longest; the shafts strong, towards the end elastic. Tail rather long, nearly even, of twelve broad, rounded feathers.

Bill brownish-black, toward the base bluish, as are the soft margins; cere light greyish-blue; iris deep yellow; feet pale greyish-blue; claws black. The general colour of the plumage on the upper parts is deep brown, glossed with purple, the margins of the feathers paler. On the crown of the head and the occiput, the feathers have merely a central streak of dark brown, the rest being yellowish-white; the sides of the head are white; a broad blackish-brown band from the eye down the side of the neck. Quills dark brown, the primaries toward the end brownish-black, and glossed with purple, the inner webs barred with greyish-white; tail light brown, faintly barred with darker, the tips yellowish-white, the inner webs, those of the two middle feathers excepted, marked with confluent greyish-white spots. All the lower parts are white, excepting the lower part of the neck and a portion of the breast, on which there are numerous light brownish-red streaks, and the lower wing-coverts, which are spotted with brown.

Length to end of tail 24 inches, to end of wings 26; extent of wings 64; wing from flexure 20; tail $9\frac{1}{2}$; bill along the ridge $1\frac{1}{10}$; length of cere $\frac{1}{4}$; edge of lower mandible $1\frac{8}{12}$; depth of bill at fore-edge of cere $\frac{1}{12}$; tarsus $2\frac{1}{4}$; first toe $\frac{11}{12}$,

its claw $1\frac{9}{12}$; second toe $1\frac{2}{12}$, its claw $1\frac{8\frac{1}{2}}{12}$; third toe $1\frac{9}{12}$, its claw $1\frac{6\frac{1}{2}}{12}$; fourth toe $1\frac{4}{12}$, its claw $1\frac{9}{12}$.

Female.—The female differs little from the male in colour, but is considerably larger. The feathers on the upper part of the head are more broadly streaked with brown, and the coloured patch on the fore part of the neck and breast is larger.

Length to end of tail 26 inches, extent of wings 68; wing from flexure 20; tail 10; bill along the ridge 2, along the edge of lower mandible $1\frac{8}{12}$; tarsus $2\frac{4}{12}$; first toe 1, its claw $1\frac{0}{12}$; second toe $1\frac{2}{12}$, its claw $1\frac{8}{12}$; third toe $1\frac{3}{4}$, its claw $1\frac{7}{12}$; fourth toe $1\frac{1}{4}$, its claw $1\frac{1}{2}$.

Variations.—In adult birds I have not observed any remarkable variations, the white on the head and neck being merely more or less pure, the brownish-red on the breast more or less marked, and sometimes almost entirely wanting.

Changes of Plumage.—The moult is completed in December. After being worn and bleached, the feathers in autumn become of a dull light-brown, the pale-coloured tips are abraded, and the yellowish-white terminal band of the tail has disappeared. In winter, when the plumage is fresh, it is much more beautiful, glossy, and deeply coloured, as is the case with all the birds of this family.

Habits.—The Osprey prefers for its habitation the remote and thinly peopled districts beyond the Grampians; but even there it is of extremely unusual occurrence, ~~unless~~ in particular spots where it ~~finds~~ found abundant food and comparative security. In the Outer Hebrides I have never met with it; but at the mouths of rivers, and especially on lakes, along the north-west coast of Scotland, it may here and there be ~~seen~~. A pair generally take up their residence on an island of Loch Maree, the waters of which are well supplied with trout and salmon; and on all the larger lakes, such as Lochlagan, Loch Tay, Loch Awe, and Loch Lomond, a few may be ~~met with~~. On the other side of the country, it is ~~seen~~ found in Caithness and Suther-

although not many years ago, it was frequently to be seen

met with

occasionally seen.

land, as is attested by my friend Mr A. G. Macgillivray. Individuals have frequently been seen, and sometimes shot on the Tweed. Mr Stevenson of Edinburgh has in his collection a fine specimen killed there by himself. I have seen one that was shot in Fifeshire, and another among the Pentland Hills, near Edinburgh. Mr S. H. Greenhow of Tynemouth informs me that in 1835 four Ospreys were shot in April and May in that neighbourhood, and another in September. Specimens have been shot in all the eastern and in a few of the midland counties of England. Mr White of Selborne has mentioned an instance of its having been killed on a pond not far from that village; and Montagu and Dr Moore certify its not very unfrequent occurrence in Devonshire.

It appears that the Osprey is not a permanent resident with us, but arrives in spring, and departs towards the end of autumn, or in the beginning of winter. Its breeding-places are generally the ruined buildings on islands in lakes. Montagu states that he once saw its nest "on the top of a chimney of a ruin, in an island on Loch Lomond; it was large and flat, formed of sticks laid across, and resting on the sides of the chimney, lined with flags." According to the same observer, it "flies heavily, not much unlike the common Buzzard, but not unfrequently glides slowly along with motionless wing. When examining the water for prey, its wings are in continual motion, although it remains stationary for a considerable time; its superior weight perhaps renders it difficult to continue suspended in the air, with the imperceptible motion of the wings observed in the Kestrel." When crossing the bridge over the river Avon, at Aveton Gifford, in April 1811, he "observed an Osprey hawking for fish; at last its attention was arrested, and, like the Kestrel in search of mice, it became stationary, as if examining what had attracted its attention. After a pause of some time, it descended to within about fifty yards of the surface of the water, and there continued hovering for another short interval, and then precipitated itself into the water with such great celerity as to be nearly immersed. In three or four seconds the bird rose without any apparent difficulty, and carried off a trout of moderate size, and instead of

alighting to regale upon its prey, it soared to a prodigious height, and did not descend within our view."

Little of importance can be added to these notes from the accounts given by more recent observers in Britain, where the bird is so uncommon as to render a continuous account of its habits almost impracticable. In North America, however, where it is very abundant, it has been more satisfactorily examined. "The flight of the Fish Hawk," says Wilson, the Scottish ornithologist of America, "his manœuvres while in search of fish, and his manner of seizing his prey, are deserving of particular notice. In leaving the nest, he usually flies direct till he comes to the sea, then sails around, in easy curving lines, turning sometimes in the air as on a pivot, apparently without the least exertion, rarely moving the wings, his legs extended in a straight line behind, and his remarkable length, and curvature or bend of wing, distinguishing him from all other hawks. The height at which he thus elegantly glides is various, from one hundred to one hundred and fifty and two hundred feet, sometimes much higher, all the while calmly reconnoitering the face of the deep below. Suddenly he is seen to check his course, as if struck by a particular object, which he seems to survey for a few moments with such steadiness that he appears fixed in air, flapping his wings. This object, however, he abandons, or rather the fish he had in his eye has disappeared, and he is again seen sailing around as before. Now his attention is again arrested, and he descends with great rapidity; but ere he reaches the surface, shoots off on another course, as if ashamed that a second victim had escaped him. He now sails at a short height above the surface, and by a zigzag descent, and without seeming to dip his feet in the water, siezes a fish, which, after carrying a short distance, he probably drops, or yields up to the Bald Eagle, and again descends, by easy spiral circles, to the higher regions of the air, where he glides about in all the ease and majesty of his species. At once, from this sublime aërial height, he descends like a perpendicular torrent, plunging into the sea with a loud rushing sound, and with the certainty of a rifle. In a few moments he emerges, bearing in his claws his struggling prey, which he always

carries head foremost, and, having risen a few feet above the surface, shakes himself as a water-spaniel would do, and directs his heavy and laborious course directly for the land. If the wind blow hard, and his nest lie in the quarter from whence it comes, it is amusing to observe with what judgment and exertion he beats to windward, not in a direct line, that is, in the wind's eye, but making several successive tacks to gain his purpose. This will appear the more striking, when we consider the size of the fish which he sometimes bears along. A shad was taken from a Fish Hawk near Great Egg Harbour, on which he had begun to regale himself, and had already ate a considerable portion of it; the remainder weighed six pounds. Another Fish Hawk was passing Mr Beasley's, at the same place, with a large flounder in his grasp, which struggled and shook him so, that he dropt it on the shore." Yet the weight of the Osprey itself is only from four to five pounds. Sometimes, according to the same author, it overrates its strength, and "the bodies of sturgeon, and several other large fish, with that of a Fish Hawk fast grappled in them, have at different times been found dead on the shore, cast up by the waves." It may be so, but Wilson does not say that he has seen an Osprey at anchor on a sturgeon. The descent from "the higher regions of the air" too, I think requires proof. Mr Audubon says that "whilst in search of food, it flies with easy flappings at a moderate height above the water, and with an apparent listlessness, although in reality it is keenly observing the objects beneath. No sooner does it spy a fish suited to its taste, than it checks its course with a sudden shake of its wings and tail, which gives it the appearance of being poised in the air for a moment, after which it plunges headlong with great rapidity into the water, to secure its prey, or continues its flight, if disappointed by having observed the fish sink deeper." It is only when it has satisfied its hunger that, according to this more accurate observer, it sails about at a great height over the neighbouring waters.

According to the same author, the nest is generally placed in a large tree near the water, but occasionally at no greater height than seven or eight feet. On the Florida Keys he saw

it twice on the ground, and once on the roof of a low house. "The nest is very large, sometimes measuring fully four feet across, and is composed of a quantity of materials sufficient to render its depth equal to its diameter. Large sticks, mixed with sea-weeds, tufts of strong grass, and other materials, form its exterior, while the interior is composed of sea-weeds and finer grasses." The eggs, as he informs us, are three or four, of a broadly oval form, yellowish-white, densely covered with large irregular spots of reddish-brown. An egg of this bird in my possession is two inches and four twelfths in length, one inch and ten twelfths in its greatest breadth, of a short ovate form, with the narrow end much rounded, its ground colour white, with large irregular blotches of dark greenish-brown, and numerous small spots of light brownish-grey.

According to the American ornithologists above mentioned, the female, while incubating, is supplied with food by the male, and the young remain in the nest until perfectly fledged and able to provide for themselves. Their parents however assist them for several weeks after they have gone abroad. This bird is indeed remarkably affectionate and gentle, seldom molests any other species, confining itself entirely to the pursuit of its finny prey, and is more social than any other of its family. In America it is greatly molested by the White-headed Sea-Eagle, which frequently wrests from it the fish which it has just caught. In our country no instance of this kind has been observed; but with us, both the Osprey and the White-tailed Eagle are of so rare occurrence that their encounters must be very unusual.

An examination of the organs of this bird, with reference to its habits, may prove interesting not only in itself, but with respect to other birds. We may assume that in a family of a rapacious character destined to seize on living prey, it has been intended to confine itself to fish, which it must clutch from the deep as they swim near the surface. As fishes only occasionally come within reach, the Osprey is furnished with extremely long wings and strong drepressor muscles, by means of which it is enabled not only to fly with ease to great distances over the water, and remain long on wing without un-

dergoing fatigue, but also to fix itself in a particular spot with a quivering or undulating motion, in order to watch the proper moment for descending. Then, as it has to plunge into the water, or at least is liable to come in contact with it, the plumage of its lower parts is rendered more dense and compact than usual, and the elongated tufts seen on the outer side of the tibiæ in other hawks, are here replaced by short feathers. On the upper parts, however, the plumage is not more compact than in Eagles or Buzzards. Great rapidity of flight, and the power of executing sudden turnings, are not necessary for this mode of life, and therefore the tail is not so long as in hawks generally, for the Osprey, having spied its prey, merely drops perpendicularly upon it. The peculiar form of its prey, the slippery nature of its surface, and the facility which it has of getting out of reach, render necessary a very powerful instrument of prehension, and accordingly the foot has the tibia extremely muscular, the tarsus very short, the toes of extreme thickness, and covered beneath with prominent conical points. All the toes are possessed of great mobility, and the lateral can be placed at right angles to the first and third, so as to ensure an ample and secure grasp. The very elongated, well-curved, pointed claws are obviously excellent instruments for this purpose; and while in other hawks they are flat beneath and edged, they are in this rounded, so as when introduced into the soft flesh not to tear it, and at the sametime be readily withdrawn should such a measure be rendered expedient by the bird's having seized a fish too strong for it. The œsophagus and stomach do not differ essentially from those of other birds of the family; but the intestine is excessively elongated and attenuated. It is the same, but in a less degree, in the Sea-Eagles, which feed partially on fish. And hence it might be inferred that an intestine of this form is best adapted for extracting the nutriment from that sort of food, but how or why does not appear; and many birds that feed in the same manner have short and wide intestines. The capacity of the intestinal tube of the White-tailed Sea-Eagle is not greater than that of the Golden Eagle, although the length is as five to one; nor is that of the Osprey greater than that of the Buzzard, al-

though the length is as eight to one. Crude conjectures are easily made. Thus, it has been supposed " that the small quantity of nutriment which fish, as an article of food, is known to afford, rendered this extent of canal necessary, in order that every portion of the nutriment might be extracted," and that although some fish-eating water-birds have a short intestinal canal of large calibre, yet they can catch fish much more readily than the Osprey, and can therefore fill their stomach oftener. This explanation is obviously unsatisfactory, since birds very similar in mode of flight and habits, as the Frigate Pelican, have a wide intestine. It has been suggested by me that the arrangement is made on account of the Osprey's plunging into the sea, and being thus liable to sudden shocks, which have less effect upon a slender coil of intestine. But many plunging birds, as Gannets and Terns, have the intestine wide, while in the Herons, which never plunge, it is as narrow as in the Osprey.

In North America the Osprey, according to Mr Audubon, is generally distributed, occurring all over the United States, from Texas northward, as well as along the north-western coast. In Europe it is said by various authors to be found in Siberia, Norway, Russia, Germany, Holland, Switzerland, Spain, and Italy. In Africa it has been obtained in Egypt and the Cape of Good Hope. M. Temminck states its occurrence in Japan, and there is a specimen from New Holland in the museum of the University of Edinburgh.

Young.—When fully fledged, the young differ considerably from their parents, their upper parts being much darker, and all the feathers there margined with white, giving them a remarkably beautiful appearance. At this age, the bill is black, the cere on both mandibles greyish-blue, the iris rich yellow; the feet pale blue, with a tinge of green, the soles flesh-coloured, the claws black. The feathers of the head are white, each with a central brownish-black lanceolate streak, those of the occiput and nape white, with pale reddish-yellow tips. A black band passes over the eye, and a broad band of the same colour extends from behind the eye on each side down the neck,

the two meeting behind. On the upper parts in general, the feathers are chocolate-brown, tinged with purple, and marginally tipped with reddish-white. The quills are banded with white on the inner webs, their general colour brown, but the outer four purplish-black; the tail greyish-brown, the middle feathers with seven, the lateral with eight brownish-black bands, the inner webs whitish between the dark bands, the shafts brownish-white, the tip light yellowish-red. The lower parts are white; the throat with longitudinal dusky lines, the lower part of the neck and fore part of the breast with lanceolate light-brown spots, besides which there are on many of the feathers one or two concealed darker spots; the axillar feathers white, with three spots, dark-brown, reddish-brown, and brownish-yellow. The larger lower wing-coverts are white, with three broad blackish-brown bands; the next brownish-yellow, with large dusky spots, the rest brown, tipped with yellowish-white; those on the edge of the wing yellowish, with a dusky lanceolate spot; the lower tail-coverts white, tipped with reddish-yellow.

The Osprey thus affords another example of a falconine bird, which when young has the tints much darker than when adult, although more variegated.

Remarks.—Having dissected three individuals of this species, I may here present a comparative view of the dimensions of their digestive organs.

	M.	M.	F.
Tongue in length	—	1	1
Œsophagus in length	$9\frac{1}{4}$	$9\frac{1}{2}$	$9\frac{1}{2}$
Width of crop	$2\frac{1}{4}$	3	$2\frac{1}{2}$
Narrowest part	$\frac{3}{4}$	$\frac{10}{12}$	$\frac{9}{12}$
Stomach in diameter	$1\frac{3}{4}$	2	$1\frac{10}{12}$
Intestine in length	111	135	117
Greatest width of intestine	$\frac{2\frac{1}{2}}{12}$	$\frac{3}{12}$	$\frac{2\frac{1}{2}}{12}$
Least width of intestine	$\frac{1\frac{1}{2}}{12}$	$\frac{1\frac{3}{4}}{12}$	$\frac{1\frac{1}{2}}{12}$
Length of cœca	$\frac{4}{12}$	$\frac{4}{12}$	$\frac{3\frac{1}{2}}{12}$
Length of rectum	$4\frac{1}{2}$	5	4
Diameter of cloaca	1	$1\frac{1}{2}$	$2\frac{1}{4}$

The trachea of two individuals examined, a male and a female, was in the former 7, in the latter $7\frac{2}{12}$ inches long; its breadth at the upper part $\frac{4\frac{1}{2}}{12}$, $\frac{5\frac{3}{4}}{12}$; its rings 102, 96, the two lower dimidiate. Right bronchus of 22, 18 rings, left of 16, 15. The contractor muscles large, as are the sterno-tracheal; a single pair of inferior laryngeal muscles, going to the membrane between the last ring of the trachea and the first bronchial ring.

In preparing the digestive organs of an individual of this species, I found that the fluid of the proventricular glands had, after a lapse of about a week, dissolved many of the glands into a pulp, as well as the transverse muscular fibres lying over them, while the rest of the tube in its whole length was perfectly sound.

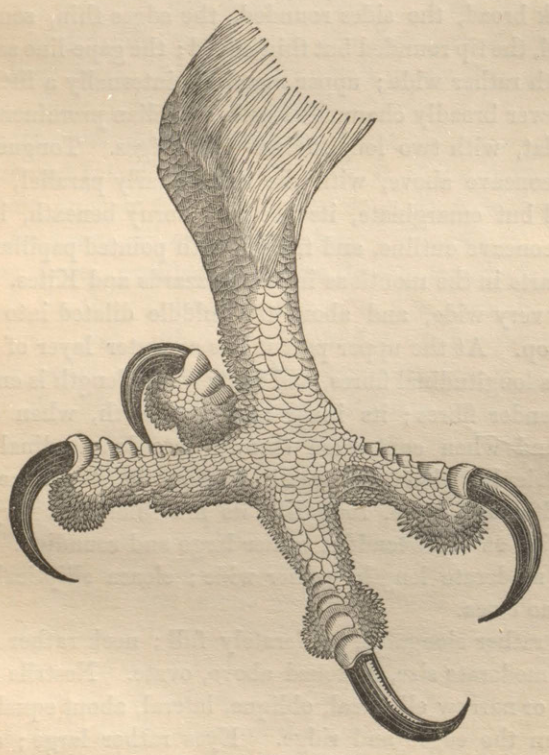


Fig. 219.

Genus V. PERNIS. ~~BEE-HAWK~~. Cuv. Pern.

Bill shorter than the head, somewhat broader than high at the base, compressed towards the end, strong: upper mandible with the dorsal line convexo-declinate as far as the edge of the large bare cere, then decurved in the third of a circle, the ridge rather narrow, the sides convex, the edges soft at the base, beyond the nostrils hard, direct, and sharp, with a very slight festoon, the tip descending, slender, acute; lower mandible with the angle of moderate length, broad, and rounded, the back broad, the sides rounded, the edges thin, somewhat inflected, the tip rounded but thin-edged; the gape-line arcuate.

Mouth rather wide; upper mandible internally a little concave, lower broadly channelled with a median prominent line; palate flat, with two longitudinal soft ridges. Tongue short, deeply concave above, with the sides nearly parallel, the tip rounded but emarginate, its free part horny beneath, its base with a concave outline, and fringed with pointed papillæ. The other parts in the mouth as in the Buzzards and Kites. Œsophagus very wide, and about the middle dilated into a very wide crop. At the upper part it has an outer layer of inconspicuous longitudinal fibres, and in its whole length is encircled with slender fibres; its inner coat is smooth, when dilated even, and when contracted thrown into longitudinal rugæ. Proventricular glandules small, oblong, forming a complete belt. Stomach large, roundish, its muscular coat very thin, and in fasciculi; its tendons rather large and roundish. Intestine of moderate length, rather wide; cloaca elliptical, very large; no cœca.

Body rather elongated, moderately full; neck rather short; head of moderate size, flattened above, ovate. Nostrils linear-oblong, or narrow elliptical, oblique, lateral, about equally distant from the edges and ridge. Eyes rather large; eyelids closely covered with small compact feathers, and destitute of ciliary bristles, but with the margins bare; the superciliary pro-

jection small. Aperture of ear large, transversely elliptical. Legs short, robust; tarsi very short, strong, roundish, covered with feathers for half their length in front, on the rest of their extent with flat hexagonal scales, of which the anterior are large. Toes of moderate length, strong, the first stouter, the fourth most slender, and connected with the third at the base by a pretty large web; all covered above with transverse series of scales, and toward the end with scutella, beneath with roundish, prominent, hard papillæ. Claws long, rather slender, arcuate, less curved than in any other British genus, tapering, acute, rather compressed, laterally somewhat convex, with a slight groove, concave beneath; those of the first and second toes nearly equal and strongest, the third longest, and having an inner sharp edge.

Plumage compact, soft, slightly glossed. Cere bare, being destitute of bristles; feathers on the fore-part of the head, cheeks, loral space, and chin, very small, ovato-oblong, obtuse, compact; those on the rest of the head oblong, of the hind-neck ovate, of the rest of the upper parts broad and rounded, of the fore-neck and breast oblong; the feathers of the abdomen and tibiæ more compact than usual; the outer tibial feathers elongated; the lower tail-coverts very long and compact. Wings very long, broad, rounded, of twenty-three or twenty-five quills, of which the third is longest, the outer five abruptly cut out on the inner web; all the rest rounded, with a minute tip. Tail long, broad, even or slightly emarginate, but at the sides rounded, of twelve broad, acuminate feathers.

This genus, of which the species are not numerous, appears to be intermediate between Buteo and Milvus, and in the general form and short strong tarsi to approximate to Pandion. It is distinguished from Buteo by having the bill longer, the cere broader, the feet much shorter and stronger, the tarsi destitute of scutella, the wings and tail much longer. From Milvus it differs in having the bill more slender, the feet much stouter, the tarsi not scutellate, the tail not forked. From all the genera of this family it is distinguished by the imbricated, compact, scale-like feathers on the parts about the base of the bill.

PERNIS APIVORA. ~~BROWN BEE-HAWK.~~

Linn Honey Pern.

HONEY BUZZARD.

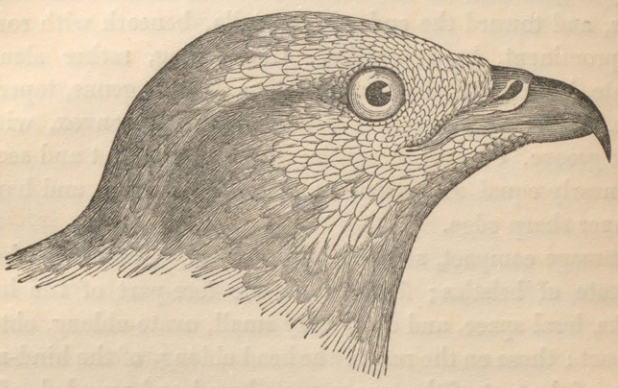


Fig. 220.

Falco apivorus. Linn. Syst. Nat. I. 130.
Falco apivorus. Lath. Ind. Orn. I. 25.
Honey Buzzard. Mont. Orn. Dict.
Buse Bondrée. Falco apivorus. Temm. Man. d'Orn. I. 67 ; III.
Honey Buzzard. Pernis apivorus. Selb. Illustr. I. 62.
Buteo apivorus. Honey Buzzard. Jen. Brit. Vert. An. 88.

Tail with four broad and numerous small dusky bands ; wings with two similar bands. Adult male with the anterior part of the head brownish-grey, the upper parts deep brown, the throat white, with longitudinal dark lines, the rest of the lower parts white, with broad bands and spots of brown. Young male with the head brown, anteriorly tinged with grey, the upper parts deep brown, the throat light reddish, with longitudinal dark lines, the rest of the lower parts deep brown, with darker longitudinal lines. Female with the forehead bluish-grey, the upper parts deep brown, the lower pale yellowish-red, with large reddish brown spots. Young with the head white, spotted with brown, the upper parts deep brown, the feathers broadly edged with light red, the lower parts light yellowish-red, spotted with brown.

The colouring of this bird, which varies nearly as much as that of the Brown Buzzard, is still a subject of dispute, some authors considering the individuals of which the head and lower parts are white, as adult, while others are of opinion that they are young. The Honey Buzzard being of very rare occurrence, so that one has little chance of meeting with a live or recent specimen in the course of many years, this question cannot be decided by me. I shall therefore confine myself to the description of two individuals obtained in Scotland, one of which I had the good fortune to receive entire. The other I have examined after it was preserved and mounted. They were both males, but while one was of a nearly uniform brown colour, the other was brown above, and white spotted with brown beneath. The former would be considered a young bird by M. Temminck, the latter an adult.

Young Male.—This individual was killed near Stirling in June 1838, and came into my hands on the 9th of that month, when it was perfectly fresh. The description which I took at the time is as follows :—The form is rather slender and elongated, the body moderately full, the neck of ordinary length or rather short, the head ovato-oblong. The bill, although slender, compared with that of other birds of this order, is rather stout. The aperture of the mouth is wide, and extends to beneath the anterior angle of the eye ; the cere large ; the upper mandible with its outline as far as the edge of the cere convexo-declinate, then curved in the third of a circle, the sides convex, the edges soft to beneath the anterior extremity of the nostrils, then hard, direct, and sharp, the tip slender, acute, descending; the lower mandible comparatively small, with the back broad, the sides rounded, the edges as in the upper, the tip rounded ; the gape-line arched from the base. Nostrils oblongo-linear, large, oblique. Upper mandible a little concave, lower broadly channelled, with a median prominent line. Tongue deeply concave above, with the sides nearly parallel, the tip rounded but emarginate. Eyelids feathered, but their margins bare. Limbs short ; tarsus robust, anteriorly covered with feathers halfway down, on the rest of its extent with angular scales.

Toes of moderate size; the first stoutest, the second next, the fourth least; the first with four large scales above, the second with three, the third with four, the fourth with three. The claws long, rather slender, tapering, arcuate; the first and second strongest, the third longest, with a thin inner edge, the second next in length, the fourth smallest.

Plumage compact. The feathers on the fore part of the head and cheeks ovate, compact, and small, especially on the loral space, and about the eye. The feathers in general are ovate, curved, with a large downy plumule, on the lower parts nearly as compact as on the upper. Wings long and very broad, extending to two inches and a half from the end of the tail; quills twenty-three; the outer six separated at the end when the wing is extended, and having the inner web cut out towards the end, but indistinctly in the inner two; all the rest rounded, with a minute tip. Tail long, a little emarginate and rounded at the end, the feathers broad. The first quill is two inches and seven-twelfths shorter than the second, which is eleven-twelfths shorter than the third, the latter exceeds the fourth by only one-twelfth, the rest gradually diminish. The middle tail-feathers are three-twelfths shorter than the third, which exceeds the lateral by ten-twelfths.

The cere is of a dusky green colour, but at the base pale yellow. The bill black, the base of the lower mandible flesh-coloured. The mouth flesh-coloured; the mandibles black within, excepting the median line of the upper; the horny part of the tongue black. The margins of the eyelids black; the iris pure yellow. Tarsi and toes orange, claws black. The loral space and anterior part of the forehead are brownish-grey; the head reddish-brown; the rest of the upper parts umber-brown, the feathers generally darker on the shaft and towards the end. The primary coverts and primary quills are blackish-brown at the end, and in the rest of their extent have generally on both webs three bands of dark-brown on a lighter ground; the inner webs white, except at the end, where they are light brown, mottled with darker; the outer quill however has only a single dark band, reduced to two spots; the second and third have two bands, also reduced to spots; on the secondaries the

dark bands are reduced to two, and gradually approximate inwards. The tail-feathers have the tips brownish-white; then a broad band of brownish-black, and a dusky space with seven indistinct darker bands, between which and the base are three large blackish bands. Upper tail-coverts light umber. The throat is light reddish-brown; the rest of the lower parts umber, each feather with the shaft and a portion near it dusky. The feathers of the legs are lighter, as are the lower tail-coverts, which have two bands of white toward the base. The concealed and downy parts of the plumage are white, which appears on the hind-neck and head when the feathers are raised, as it extends over more than half their length. The lower wing-coverts umber-brown.

The digestive organs are in all respects similar to those of the Common Buzzard. The œsophagus is six inches long, its width at the upper part one inch. The crop is very large, its width being two inches; the proventricular belt three fourths of an inch in breadth. The stomach is large, roundish, an inch and a half in diameter; its muscular coat very thin, and disposed in fasciculi; the tendons rather large and roundish. The intestine twenty-two inches long, its diameter from five-twelfths to two-twelfths; the duodenum only three inches and a half in length. The cloaca is elliptical, two inches long. There are no cœca. The crop contained four pieces of meat, which had apparently been cut with a knife; and the stomach was filled with fragments of bees and numerous larvæ, among which no honey or wax was found.

The soles were crusted with mud or earth; the claws very slightly blunted.

Length to end of tail $24\frac{1}{4}$ inches; extent of wings 52; wing from flexure $16\frac{3}{4}$; tail $11\frac{1}{2}$; bill along the ridge $1\frac{4\frac{1}{2}}{12}$, along the edge of lower mandible also $1\frac{4\frac{1}{2}}{12}$; tarsus $1\frac{1\frac{1}{2}}{12}$; first toe $\frac{1\frac{1}{2}}{12}$, its claw 1; second toe $1\frac{4}{12}$, its claw 1; third toe $1\frac{9}{12}$, its claw $1\frac{5}{12}$; fourth toe $1\frac{1\frac{1}{2}}{12}$, its claw $\frac{9}{12}$.

That this individual was not a young bird of the season is evident, not from the firmness of its plumage but from the texture of its bones, as well as the period at which it was procured. Yet if we compare the Bee-Hawk with the Kite, we shall

be induced to consider our specimen as young, for in the latter species the young are much darker than the adult, and have the bands on the tail more distinct. I am therefore inclined to agree with M. Temminck in this matter. The other specimen which I have examined I shall now describe.

Adult Male.—In form and proportions this individual agreed with the above. The tarsi, which are feathered anteriorly about halfway down, are covered with flat hexagonal scales, of which the anterior are very large, and six in a line. The toes are covered above with transverse series of scales, enlarging toward the end, where they change into scutella, of which there are four on the first, three on the second, three on the third, and four on the fourth. The claws are long, slender, curved in about the fourth of a circle, flat beneath, extremely acute. The plumage is soft, but compact, rather glossy on the back and wings. The cere quite bare. The feathers on the loral spaces and fore part of the head and cheeks small, ovate, and compact; those on the rest of the head short and rounded; on the body broad and rounded; the elongated feathers of the tibiæ and abdomen more compact than usual. The wings very long, broad, and rounded; the first five primary quills deeply sinuate on the inner web, and beyond the sinus having their edges nearly parallel until near the rounded tips; the secondary quills thirteen, very long, broadly rounded, with a minute acumen. Tail nearly as long as the body, neck, and head, even, but with the lateral feathers on each side a little shorter.

Bill black; cere dusky; tarsi and toes yellow, claws black. The head to behind the eyes, the auriculars, and the short feathers margining the lower mandible, are light brownish-grey. That colour gradually passes on the hind-neck into deep umber-brown, which is the general tint of the upper parts, which are however shaded with grey, the shaft of each feather, together with a patch on the centre, being blackish-brown. All the feathers are white at the base, those on the hind-neck for two-thirds of their length. The larger wing-coverts and scapulars are brownish-grey in the middle; the secondary quills grey in

the middle, faintly barred with brown, brownish-black toward the end, the margins of the tips pale brown. The alular feathers and primary quills are similar, their grey part sprinkled with brown dots, and a large portion of their inner webs white. The tail-feathers are umber-brown, tinged with grey; their base white, that colour succeeded by a bar of deep umber; then, within half an inch, another bar of the same colour, partially concealed by the tail-coverts; the next brown bar, which is all exposed, is a little more than half an inch distant, and at an interval of six inches, on which are six faint bands of brown, is a subterminal bar of blackish-brown, an inch and a half in breadth; the tips brownish-white. The sides of the neck are greyish-brown above, umber-brown below; the throat white, with brownish-black shaft-lines; the lower part of the neck anteriorly pale brown, with brownish-black lines; the breast, sides, abdomen, and lower tail-coverts, white, with broad transverse bands of umber-brown. These bands are formed in this manner:—The feathers of the lower neck have a large terminal triangular spot, those of the fore-breast have a similar spot, and about the middle a band; those on the lower breast and sides a spot and two bands; the long feathers on the side a spot and three bands; those of the abdomen two, the lower tail-coverts three, the axillar feathers four bands. The outer lower wing-coverts are chocolate-brown, the rest banded with white and brown; the lower surface of the quills and tail-feathers is pale grey, with white shafts, and three bands of brownish-black, two being sub-basal, and one terminal.

Length to end of tail 24 inches, to end of wings 23; extent of wings estimated at 50; wing from flexure $15\frac{3}{4}$, tail 10; bill along the back $1\frac{2}{12}$, along the edge of lower mandible $1\frac{8}{12}$; tarsus 2; first toe $\frac{10}{12}$, its claw $\frac{11}{12}$; second toe $1\frac{4}{12}$, its claw 1; third toe $1\frac{8}{12}$, its claw $1\frac{1\frac{1}{2}}{12}$; fourth toe $1\frac{4}{12}$, its claw $\frac{10}{12}$.

Honey Buzzard

Habits.—The ~~Bee-Hawk~~ is of rare occurrence in any part of Britain, and being consequently in great request among collectors, has little chance of remaining unmolested whenever it makes its appearance. In the northern and middle divisions of very seldom Scotland it has ~~not yet~~ been met with, and in the southern I

am aware of only three instances of its having been killed. In the Statistical Report of the Parish of Hamilton, the Rev. Mr Patrick states that one was shot at Chatelherault in the autumn of 1831. The light-coloured specimen above described, which formerly belonged to Dr Bushnan, then of Dumfries, but is now in the museum of the University of Edinburgh, was killed at Drumlanrig in that county. The other, also described, and now in my collection, which has in four years gradually increased to two thousand specimens, was killed near Stirling. In Northumberland and Durham several individuals, some of which have been described by the Hon. Mr Liddel, J. P. Selby, Esq., and Sir William Jardine, Bart., have been obtained of late years. James Wilson, Esq., one of the very few zoologists of Edinburgh, remembers having seen in Penrith three, which, with some others, were shot in Cumberland by Lord Lonsdale's game-keepers. It has several times been killed in Norfolk and Suffolk, as well as in Dorsetshire, Devonshire, and Worcestershire. In the midland and western parts of England it appears to have been very seldom met with.

D. Robertson p. 738.

Owing to the unfrequency of its appearance, its habits are very little known. It has been seen attacking the nests of wasps, and these animals with their larvæ have been found in its stomach. In consequence of its efforts in digging them out of the ground, its feet have been seen covered with soil, as have its bill and the fore part of the head. Willughby and Vieillot say it runs very swiftly, like a domestic fowl, but this statement, if we judge from analogy and the structure of the feet, seems to require confirmation. Various observers have found in its crop and stomach remains of moles, mice, birds, frogs, lizards, snails, and caterpillars, and it has been seen skimming over water as if in pursuit of insects. In the crop of a female shot in Selborne Hanger, White says there were found limbs of frogs and many grey snails. Willughby relates that a pair which bred in the deserted nest of a kite, fed their young with larvæ of wasps, as well as with lizards and frogs. M. Temminck adds hamsters to its bill of fare, and doubtless it feeds much in the same manner as the Buzzard, which it usually excels in fatness, although that bird is generally found in excellent con-

dition, especially in autumn and winter. Indeed, owing to the great quantity of oily fat under the skin, it is difficult to prepare specimens of it. Its flight is said to be low and not usually extended, and this may be the case when it has assumed a station in a favourable locality; but from the length and form of its wings and tail, it must have a mode of flight very similar to that of the Kite. With us it is apparently a summer visitant, and not a permanent resident, for all the specimens whose dates of capture or death are recorded, have been obtained in summer and autumn.

A few instances of its breeding in England are known. White, in his celebrated Natural History of Selborne, says, "A pair of Honey Buzzards built them a large shallow nest, composed of twigs, and lined with dead beechen leaves, upon a tall slender beech, near the middle of Selborne Hanger, in the summer of 1780. In the middle of the month of June, a bold boy climbed this tree, though standing on so steep and dizzy a situation, and brought down an egg, the only one in the nest, which had been sat on for some time, and contained the embryo of a young bird. The egg was smaller, and not so round as those of the common buzzard, was dotted at each end with small red spots, and surrounded in the middle with a broad bloody zone." Mr J. M. Brown informs me that he "once found a nest of the Honey Buzzard in the woods of Abergeldie in Aberdeenshire. It was built in a tree, and resembled that of the Common Buzzard. There were three eggs, of a whitish colour spotted with light and dark brown. The male was shot, before it was known what species had been met with." M. Temminck says its eggs are "marked with large reddish-brown patches, and are often entirely of that colour, or with numerous spots so close together that the white is scarcely perceptible." An egg from France, in the museum of the University of Edinburgh, is of a broadly elliptical form, two inches and half a twelfth in length, one inch and six and a half twelfths in breadth, white, with blotches of greenish-brown, which have probably been at first reddish-brown. Mr Yarrell, in his History of British Birds, mentions his having seen three or four specimens, one of which resembled that described

by White, while another in his collection is "mottled nearly all over with two shades of orange-brown: long diameter two inches and one line; transverse diameter one inch nine lines."

Two young birds seen by Willughby were "covered with a white down, spotted with black. Their feet were of a pale yellow; their bills between the nostrils and the head, white." Beyond this, I apprehend, there is little certainty, for the young partially or fully fledged have not, it would appear, been described from observation. It may however be expedient to adjoin the following notice by M. Temminck. "The young of the year have the cere yellow, and the iris light-brown; the head spotted with white and brown; the lower part of the body of a reddish-white with large brown spots; the feathers of the upper parts margined with reddish.

"*The female and the young* have only greyish-blue on the forehead; the fore part of the neck marked with large spots of light-brown; breast and belly of a yellowish-red with spots of deep brown; upper parts of a reddish-brown with darker spots; often the lower part of the body whitish with spots of reddish-brown."

Genus VI. MILVUS. Briss. KITE.

Bill shorter than the head, somewhat broader than high at the base, much compressed toward the end, strong; upper mandible with the dorsal line slightly convex, and descending a little to the edge of the large bare cere, then decurved in the fourth of a circle, the ridge broad and flattened at the base, toward the end narrow but convex, the sides rapidly sloping, and but slightly convex, the edges soft at the base, beyond the cere hard, direct, and sharp, with a slight festoon, the tip deflected, tapering, trigonal, rather blunt; lower mandible with the angle large, wide, anteriorly rounded, the outline slightly convex, the back broad, the sides rounded, the edges thin, somewhat inflected, the tip rounded, but thin-edged; the gape-line nearly straight.

Mouth wide; upper mandible internally a little concave, with a median ridge, lower deeply concave, with a median prominent line; palate flat, with two papillate longitudinal soft ridges; posterior aperture of the nares oblongo-linear, margined with acute papillæ. Tongue short, fleshy, sagittate, and papillate at the base, concave above, horny beneath, rounded and emarginate. Œsophagus wide, about the middle dilated into a moderate crop; proventricular belt complete. Stomach roundish; its muscular coat thin, being composed of a single series of fasciculi, the lateral tendons roundish. Intestine of moderate length, slender; cœca very small; cloaca very large and globular. Plate XXI, Fig. 2.

Body moderately full, compact; neck short; head of moderate size, ovate, rather flattened above. Nostrils rather small, elliptical, oblique, lateral, nearer the ridge than the edge, and close to the anterior margin of the cere. Eyes large; eyelids feathered, and furnished with ciliary bristles; the superciliary ridge prominent. Aperture of the ear large and

roundish. Legs short, robust; tibiæ short; tarsi very short, roundish, feathered anteriorly for more than a third, then covered with a few large scutella, on the sides and behind with angular scales; toes of moderate length, strong, the first and second nearly equal, the third much longer, the fourth more slender than the rest, a little longer than the second, and connected with the third by a pretty large basal web; all covered above in nearly their whole length with large scutella, laterally and beneath with prominent tubercular scales. Claws long, well curved, tapering, compressed, very acute, convex on the sides, concave beneath; the first and second largest, and nearly equal, the third longest, and having an inner sharp edge.

Plumage soft, rather blended, slightly glossed. Cere bare on its upper part; space between the eye and bill closely covered with small, slender, bristle-tipped feathers, of which the base is downy. Feathers of the head, neck, and breast oblong and pointed, of the outer part of the tibia elongated, as are the lower tail-coverts, of the abdomen softer and loose, of the upper parts broadly ovate and rounded. Wings extremely long, broad, narrow, but rounded at the end; the third quill longest, the fourth almost equal, the first short; the primary quills of moderate strength, broad, toward the end tapering, incurved, with the tip rounded, the outer five having the inner web cut out. The secondary quills thirteen, long, broad, rounded, with a minute tip. Tail very long, broad, forked or emarginate, of twelve broad feathers.

The genus Milvus, of which the species are not numerous, is very intimately allied to Pernis, from which it is distinguished by the still more elongated wings and tail, the bristly nature of the covering of the loral space, and the more curved claws. It approximates to the genus ~~Elanus~~, which has the wings and tail extremely elongated, and differs further in having the tarsi destitute of scutella. The Kites are remarkable for their gliding and buoyant flight. They prey on birds, small quadrupeds, reptiles, insects, sometimes fishes, and occasionally eat the flesh of dead animals. Only one species occurs in Britain, in some districts of which it is still rather plentiful.

Nauclerus

1. MILVUS REGALIS. THE ~~RED~~ KITE.

~~COMMON~~ KITE. GLED, GLEAD, GLADE. RED GLED, SALMON-TAILED GLED, FORK-TAILED GLED. PUTTOCK. CROTCHET-TAILED PUTTOCK. AN CLAMHAN GODHLACH.

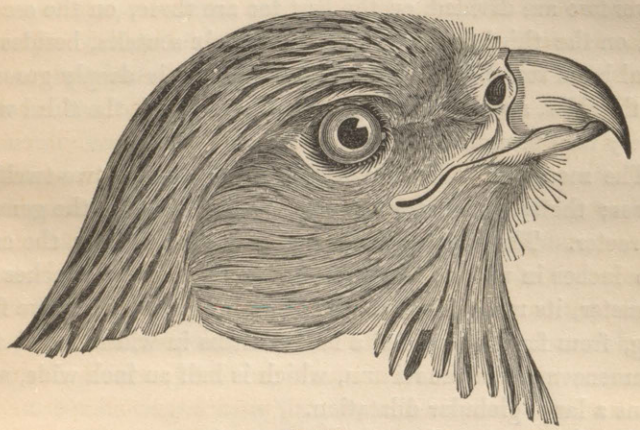


FIG. 221.

Falco Milvus. Linn. Syst. Nat. I. 126.
Falco Milvus. Lath. Ind. Orn. I. 20. Old.
Falco austriacus. Lath. Ind. Orn. I. 21. Young.
Kite. Mont. Orn. Dict.
Milan Royal. Falco Milvus. Temm. Man. d'Orn. I. 59.
Kite or Glead. Milvus vulgaris. Selb. Illustr. I. 74.
Common Kite. Milvus Ictinus. Jen. Brit. Vert. An. 86.

Male with the upper parts reddish-brown, marked with longitudinal blackish-brown streaks, the lower parts light brownish red, with narrower dusky streaks. Female with the head and upper part of the neck greyish-white, streaked with dusky, the other parts nearly as in the male. Young of a duller brownish-red, with the central dark markings of the feathers broader. Tail deeply emarginate.

Male.—The Kite is distinguished from the other native birds of this family by the superior elegance of its buoyant flight, as well as by its elongated wings, and deeply emarginate tail. Its form, which closely approaches to that of the Bee-Hawk, is not less graceful than that of any other British species, the body being short, ovate, and compact, the head of moderate size, the neck short, as are the feet, while the organs of flight are greatly elongated, and the bill and claws of moderate size. On the tarsus are seven anterior scutella, of which the lower two are divided, on the first toe are three, on the second six, on the third twelve, on the fourth six scutella, besides several basal series of scales. The hind claw is deeply grooved on the sides, and slightly larger than the second, the third with a very thin prominent inner edge.

The mouth is wide, measuring an inch and two-twelfths across; the tongue and other parts as described in the generic character. The œsophagus six inches and a half long, the crop two inches in width; the stomach round, and two inches in diameter, its muscular coat very thin. The intestine five feet long, from four to two and a half twelfths in width, until the commencement of the rectum, which is half an inch wide, and forms a large globular dilatation.

The plumage is rather compact on the upper parts, more blended on the lower; the feathers very downy at the base, with a rather large plumule. The loral space is covered with divergent slender bristle-tipped feathers; the greater part of the cere bare; the ciliæ large and strong. The feathers of the head, neck, and breast are narrow and pointed, of the back ovate and rounded, of the sides, outer part of the tibia, and subcaudal region, elongated and obtuse; those of the abdomen downy. The wings are broad but pointed, although the first quill is four and a half inches shorter than the fourth, which scarcely exceeds the third, the second half an inch shorter than the fifth; the outer five quills deeply cut out on the inner web, and less so on the outer; the secondary quills very broad, rounded, with a minute acumen; the primary coverts broad and rounded, the alula large. The tail is very long, deeply emarginate, of twelve broad, rounded feathers, the

outer curved a little outwards at the tip, and three inches shorter than the central. The tips of the wings when closed reach to the end of the middle tail-feathers.

The bill is brownish-black, its base, basal margins, and cere pure yellow; the superciliary ridge and eyelids dull yellow, the margins of the latter dusky. The iris is pale yellow. The feet of a rich yellow inclining to orange, the claws brownish-black. The general colour of the head and neck is light brownish-yellow, longitudinally streaked with blackish-brown, the tips of the feathers on the head greyish-white; the anterior part of the forehead, the cheeks, and the throat greyish-white, streaked with brownish-black. The anterior upper parts of the body are light reddish-brown, each feather with a narrow lanceolate median brownish-black mark. On the scapulars the dark markings are broader. The middle and hind parts of the back are light red, with linear dusky streaks. The alula, primary coverts, and outer five primary quills are deep bluish-black; the other primaries have the greater part of the outer web greyish-brown; and the inner web of all, except the first, is paler, barred with brownish-black, with the marginal portion yellowish-white. The secondary quills are greyish-black, tinged with purple; their inner webs more or less barred or mottled, and their tips reddish-white; the inner secondaries similar to the feathers of the back, but with their inner webs barred with dusky. The tail is brownish-red, with dusky shafts, the outer two feathers on each side having the greater part of the outer webs blackish-brown, their inner webs with about twelve faint dusky bars, and most of the other feathers with traces of similar bars. The fore part of the neck, the breast, and the sides are light yellowish-red, each feather with a very narrow, tapering medial dusky streak, and a reddish-white tip; the abdominal and tibial feathers, and the lower tail-coverts, much paler, with only the shafts dark brown until near the end.

Length to end of tail 25 inches; extent of wings 61; wing from flexure 19; tail $13\frac{1}{2}$; bill along the ridge $1\frac{6}{12}$, along the edge of lower mandible $1\frac{7}{12}$; tarsus 2; first toe $\frac{10}{12}$, its claw $1\frac{2}{12}$; second toe $\frac{11}{12}$, its claw $1\frac{2}{12}$; third toe $1\frac{7}{12}$, its claw $\frac{11}{12}$; fourth toe 1, its claw $\frac{8}{12}$.

Female.—The female, although considerably larger, differs little from the male in colour, the upper parts being merely of a deeper tint, the head paler and tinged with grey. The following is the description of a fine individual obtained in Dumbartonshire. The tongue is ten-twelfths of an inch long, with the base emarginate and papillate, the tip rounded. The œsophagus six inches long, the crop an inch and a half in width. The stomach globular, an inch and four-twelfths in diameter; its muscular coat very thin, being composed of a single series of fasciculi. The whole length of the intestine is five feet six inches; the duodenum, which is eighteen inches long, is convoluted in four folds. The cloaca is globular, an inch and a quarter in width. On the tarsus are seven scutella, of which one of the lower is slit; on the first toe three, on the second three, on the third ten, on the fourth six. The wings extend half an inch beyond the fork of the tail, of which the lateral feathers are three inches and a half longer than the middle. The first quill is three inches and a quarter shorter than the second, which is an inch and three quarters shorter than the third, this latter being four-twelfths shorter than the fourth, which exceeds the fifth by ten-twelfths. The bill and claws black; its base and the cere rich yellow, as are the tarsi and toes; the iris pale yellow. The head and upper part of the neck are greyish-white, longitudinally streaked with blackish-brown. The general colour of the fore part of the back, scapulars, and wing-coverts, is brownish-red, each feather with an elongated central deep-brown space, broader on the scapulars, and much narrower on the wing-coverts. Alula, primary coverts, and outer five quills brownish-black, the other primaries greyish-brown externally; the secondaries deep brown, the inner greyish-brown. The inner webs of the primaries toward the base are greyish-white, of the secondaries grey, all barred or mottled with dark grey. The middle and hind parts of the back, with the upper tail-coverts, light red, each feather with a brownish-black shaft-line. The tail light red, the two outer feathers on each side dusky on their outer webs, all barred with deep brown, the bars on the outer feathers twelve, on the middle reduced to nine small central traces. The lower parts are light red, with

longitudinal pointed streaks of blackish-brown, which gradually become narrower, so as to be confined to the shafts on the tibial and subcaudal feathers, which are of a lighter tint. The base of all the feathers is white, and the scapulars, which are very large, have four or five transverse dusky bars.

Length to end of tail 27 inches; extent of wings 63; wing from flexure $19\frac{3}{4}$; tail 14; bill along the ridge $1\frac{8}{12}$, along the edge of lower mandible $1\frac{9\frac{1}{2}}{12}$; tarsus $2\frac{2}{12}$; hind toe $\frac{10}{12}$, its claw $1\frac{2}{12}$; second toe $\frac{10}{12}$, its claw $1\frac{2}{12}$; third toe $1\frac{8}{12}$, its claw $\frac{11}{12}$; fourth toe 1, its claw $\frac{8}{12}$.

An individual shot in Nairnshire, in April 1832, and similar to the above, was $27\frac{1}{2}$ inches in length, and 64 in alar extent. The entire length of the intestinal canal was 70 inches, of which the œsophagus measured 7; the stomach 2 inches in diameter.

Variations.—Differences in size are not very remarkable in individuals of this species; nor are those of colour very decided, consisting chiefly of a greater or less breadth of the dusky streaks, and a varying depth of tint in the reddish parts.

Changes of Plumage.—The moult is not completed until late in autumn. When the plumage is new, the tints are much brighter and deeper than in summer, toward the end of which the dark parts are tinged with greyish-brown, the red are faded, and the paler margins and tips abraded.

Habits.—In the northern parts of Scotland, the Kite is of very rare occurrence; in the outer Hebrides I am not aware of its having been observed; and in the counties to the south of the Friths of Tay and Clyde, it is of extremely rare occurrence; but from Stirling and Perth westward, it is often seen, and in some parts of the counties of Dumbarton, Argyle, and Perth, cannot be considered as scarce. In Cumberland and Westmoreland it appears to be more frequent than in the eastern parts of the north of England; while in the southern it is very seldom met with. Montagu remarks that in twelve years' residence he never observed but one individual in the southern

parts of Devonshire. Thus, although the species is ~~not~~ widely extended on the Continent, being found from Norway to Italy, and thus is not peculiarly a northern bird, it is more abundant in the middle districts of Scotland than in any part of England, where, owing to the care bestowed on the preservation of game, it has less chance of thriving than in a wilder country.

The flight of this bird is remarkably elegant, the lightness of its body, and the proportionally great extent of the wings and tail, producing a buoyancy which reminds one of the mode of flying of the Gulls and Jagers. When searching for food, it moves along at a moderate height, wheeling and gliding in an undulatory course, and proceeding at intervals with motionless wings. Like the Buzzard and Eagles, it sometimes soars to a great elevation, gliding in circles, and sailing gracefully with outspread wings and partially expanded tail, the peculiar form of which renders it recognisable even at a very great distance. All the hawks which prey chiefly on mice, lizards, and other small animals which they seize when on the ground, have a habit of fixing themselves at intervals in the air, apparently for the purpose of examining the space beneath them, and this remarkable character is observed in the Kite, although it is not so decided as in the Kestrel. "One cannot," says Buffon, "but admire the manner in which the flight of the Kite is performed; his long and narrow wings seem motionless; it is his tail that seems to direct all his evolutions, and he moves it continually; he rises without effort, comes down as if he were sliding along an inclined plane; he seems rather to swim than to fly; he darts forward, slackens his speed, stops, and remains suspended or fixed in the same place for whole hours, without exhibiting the smallest motion of his wings." This mode of flying is very different from that of the heavy-bodied, compact, pointed-winged Falcons, which speed along with quick beats of the wings, pursue their prey in open flight, and seldom attack a bird on the ground. The Kite on the contrary usually obtains its food there, for, as it consists for the most part of snakes, lizards, frogs, small mammalia, and young birds, it cannot gratify those observers who are pleased with nothing less than the dashing flight of the fierce Peregrine, and are

profuse in contemptuous epithets when speaking of those hawks which, being furnished with very long rounded wings, are not well able to overtake a bird in open flight. Occasionally it feeds on carrion, dead fish, and insects, as well as worms, and has been accused of destroying young lambs, and committing depredations on poultry. But little apprehension is now necessary on the latter ~~score~~, and in truth the Sparrow Hawk is the point kite of the farm-yard. A writer in Mr Loudon's Magazine of Natural History says he has frequently seen a kite come from the forest at Blois to fish in the Loire, which it seemed to do with much success, seldom appearing to miss its prey; and both on the continent and in this country it has been seen feeding on dead fish.

Very contradictory accounts of the moral and physical powers of this bird have been given by authors. Thus, Willughby represents its audacity as such as to render it an object of apprehension and hatred to housewives on account of its depredations on poultry; and Montagu relates that one was so intent on obtaining some chickens from a coop, as to afford a servant girl an opportunity of knocking it down with a broom. The same author states that a kite, which had been for some time hovering over a woman who was washing some entrails in a stream, came down and carried off a portion of them that extended some yards into the water, in spite of all her efforts to frighten it away. These are acts of courage or audacity; but then they are met with remarks on the cowardly character of a bird which allows itself to be defeated by the Sparrow Hawk, and intimidated even by a clucking hen. The following character by M. Valmont Bomare is of a mixed kind, and in most respects, I believe, not incorrect. "The Kite, when it flies, extends its long wings and balances itself in the air, where it remains a long time in a manner motionless, without its wings appearing to be agitated; but it directs at its will all its motions by those of its tail; always master of its flight, it quickens or slackens it, shoots along or remains suspended in the same point, according to circumstances. Its sight is very penetrating. This powerful bird pursues only field-mice and young birds; in defect of these it pounces on reptiles, even grasshoppers,

dead fish thrown ashore by the waves, and sometimes on carrion. It is not afraid of approaching dwelling-places, and carries off a great number of ducklings, goslings, and chickens; but the mere anger of the hen is enough to drive it back, and it prese tly flies off. No ird has a more easy or rapid flight. It is named the Royal Kite, because it was subservient to the pleasure of princes, who hunted it with the falcon and sparrow-hawk; but the epithet royal is ill merited by the kite. In fact we see this cowardly bird, which ranks among the ignoble hawks, because it is not susceptible of any education, although endowed with all the faculties which ought to give it courage, and having no defect of arms, strength, or agility, refuse to fight, and fly before the much smaller sparrow hawk, turning and rising to conceal itself in the clouds, until the more active and courageous hawk overtakes it, assails it with wings, talons, and bill, and drags it to the earth less wounded than beaten, and more vanquished by the dread than by the strength of its enemy."

wonderful

There is nothing ~~marvellous~~ in a Falcon's beating a Kite, it being a more muscular and vigorous bird. As to the Sparrow Hawk, its audacity seems scarcely to have any bounds, for it has been seen to strike even a Golden Eagle, and it is very probable that it might disable a Buzzard as well as a Kite. If this bird does not defend itself against its puny antagonist, it must be because its organization does not fit it for this sort of warfare, and if it seldom ventures to attack a large bird or quadruped, it must be for the same reason; yet the Kite, judging from its appearance, is well furnished with arms, for its bill is powerful, and its claws well curved and finely pointed, and it has a kind of flight not excelled in ease and flexility by that of any other British bird of prey. Few of our birds have been yet studied with sufficient minuteness and care, so that the accounts given by authors are not always to be depended upon. For my part, I am more disposed to give credit to those who admire the Kite for its good qualities, rather than despise it for its inferiority to some other birds. As to its ignobility, or, in other words, its incapability of being taught, this is contradicted by Mr Thompson of Belfast, who,

in the Magazine of Zoology and Botany, states that "Mr R. Langtry, when at Loch Awe, in Argyllshire, early in the summer of 1833, procured from the nest two young Kites, which proved a highly interesting addition to his aviary. They at once became very tame and familiar, and were so gentle in disposition as to be most engaging. Every morning they had their liberty, never flew far, but soared to a great height in the air, and, in still repeated circles, displayed their graceful and peculiar flight. To either lure or fist they always returned when called. Mice were preferred by them to birds or any other food. When these Kites were on wing, rats let off from the cage-trap were expertly caught by them."

In the south-eastern counties of Scotland this bird is so seldom seen that when it happens to present itself it excites a great degree of curiosity. "In the neighbourhood of Bathgate," Mr Weir writes to me, "the Fork-tailed Kite very seldom appears, as during the long period of twelve years I have seen one male only. For three successive seasons he frequented this parish, and was in the almost daily habit of visiting the same localities, making his appearance at his different haunts about the same hour each day. Amongst partridges and other birds he committed very great havoc. His flight was easy and graceful, consisting of curves and extensive circles, which were performed by the almost imperceptible motion of his wings, and guided by his forked and elongated tail. He occasionally soared to a great height. When with outstretched wings he performed some of his majestic aërial evolutions, he has again and again delighted and astonished the inhabitants, who believed that he was one of Jove's noble birds that had come from the cold regions of the north to visit this our more genial clime. In the pursuit of this very shy bird I have spent many a weary hour in wandering over mountain and dale; indeed, I had almost given up the hope of ever getting within reach of him, until one morning when shooting I observed him at a distance intent upon securing a partridge for his repast. He fortunately pounced upon it near an old and very long wall on the lands of Coston, in the parish of Bathgate. With almost breathless anxiety and high palpita-

tion of heart, I crept upon my hands and knees until I was within sixty yards of the place where he stood. Up he started so soon as I raised my head above the wall. I levelled my gun, and brought him to the ground. In securing this my long-wished-for prize, I had some difficulty, as when I approached him, he struck at me with his bill and talons most fiercely and resolutely. I assure you (for you, Sir, experimentally know the enthusiasm with which one is excited when in pursuit of a fine specimen of the feathered tribe) that I could not have been elated with greater self complacency, even though I had, at the late far-famed tournament, encountered and defeated the noble Earl of Eglinton, or the redoubtable Marquis of Waterford, aye, and received the well-earned palm of victory, and the smiles of approbation from the 'bewitching and matchless Queen of Beauty.' This Kite is the one which belongs to Mr Henderson, and which you have at present." It is the specimen from which I have taken the description of the male.

I have never seen a Kite's nest, but have examined two eggs taken from one in Argyllshire, of which one was bluish-white, the other yellowish-white, clouded with reddish-brown; their form broadly elliptical, the greatest diameter two inches and a quarter, the breadth an inch and eight twelfths. Mr Yarrell, in his well-arranged and beautifully illustrated History of British Birds, says, "The nest, formed of sticks, and lined with various soft materials, is usually placed in the forked branch of a tree in a thick wood. Two, and sometimes three eggs, of a short oval form, measuring two inches and two lines in length by one inch nine lines in breadth, of a soiled white colour, marked with a few reddish-brown spots over the larger end, are laid early in the season." Two eggs from France which I have seen were of this kind, being white, with a few dots of brown, and almost precisely of the same dimensions. In defending its nest the Kite shews no lack of courage, for it has been known to attack the aggressor, and in all cases threatens him by its loud screams and violent plunges.

Young.—The young, which at first are covered with white down, are when fledged of a darker and duller colour than the

adult. The head and neck are of a darker tint, but have the feathers tipped with whitish; on the rest of the upper parts the feathers are brownish-black, with broad yellowish-red margins, their tips whitish, the dark central markings being larger than in the adult, and on the back and wings glossed with purple. The tail is much darker, its dark bars, of which there are twelve on the outer feathers, distinct and extending over both webs, the tips yellowish-red. The throat is whitish, with very slender shaft-streaks, the rest of the lower parts brownish-red, fading behind into dull light-red, the elongated central markings brownish-black, gradually becoming narrower, and disappearing on the abdomen, tibial feathers, and lower tail-coverts, of which the basal part of the shaft only is dusky. The cere and feet are pale yellow, the bill and claws brownish-black, the iris yellowish-brown. In the female the last dusky bar on the tail is larger than the rest, but not in the male.

Progress toward Maturity.—In the second plumage, the colours and markings are nearly the same as in the adult state, but the feathers on the head are largely tipped with white, those of the lower part of the hind-neck with yellowish. As the bird advances in age, the head assumes more of a greyish-white tint, the lower parts become of a lighter red, the dark central markings of the feathers grow narrower. The female has always more greyish-white on the head, some of the feathers of the back tinged with grey, and the red of the lower parts lighter than in the male.

Remarks.—The gradation of colouring in this species deserves to be here alluded to, as, with others, it affords an analogy in cases not known from direct observation. In the first place, the young are darker than the adult; the central dark markings of their feathers are larger, and the light-coloured margins narrower, while the tips are whitish on the head and neck. The dark brown or blackish tints become tinged with grey, the light tints become paler but clearer, and the dark bars diminish in size as the bird advances in age. Such appears also to be the case in the Buzzards and Perns, and such it certainly is in the Hawks and Falcons.

Vigors. Nauclerus.

Genus VII. NAUCLERUS. ~~SWALLOW-KITE~~.

Bill short, broader than high at the base, much compressed toward the end, of moderate strength; upper mandible with the dorsal line declinato-decurvate from the base, the sides nearly flat, the ridge broad as far as the edge of the cere, the sharp edges with a slight festoon, the tip slender, acute, and declinate; lower mandible with the angle very wide, the dorsal line slightly convex, the ridge broad, the edges slightly inflected, much decurved toward the tip, which is rounded.

Palate flat, with two longitudinal ridges; upper mandible with a tuberculate median ridge, lower deeply concave; posterior aperture of the nares oblongo-linear, with the edges papillate. Tongue somewhat decurved, emarginate and finely papillate at the base, flat above, its tip narrow and acutely emarginate. Œsophagus of nearly uniform width, being destitute of crop, and thus resembling that of the Owls; its walls extremely thin; stomach very large, round, slightly compressed, its muscular coat very thin, and composed of a single series of fasciculi. Intestine short and rather wide; pylorus with three knobs, duodenum forming a loop in the usual manner; no cœca; rectum short, with a large globular dilatation.

Head rather large, roundish, flattened above. Eyes large; nostrils round, with a central papilla; aperture of ear roundish and rather large. Neck short, body compact. Feet short; tarsus very short, robust, covered all round with scales; toes of moderate size, scutellate above, covered beneath with prominent pointed papillæ. Claws rather long, well curved, slender, acuminate.

Plumage blended, glossy, on the back and wings rather compact. Wings extremely elongated, rather narrow, and pointed; the third quill longest; the secondaries short and rounded. Tail extremely long, very deeply forked, of twelve feathers.

Linn. Swallow-tailed Nauclerus.

1. NAUCLERUS FURCATUS. THE ~~WHITE-HEADED~~ SW~~ALLOW-KITE~~.

SWALLOW-TAILED HAWK. SWALLOW-TAILED KITE.

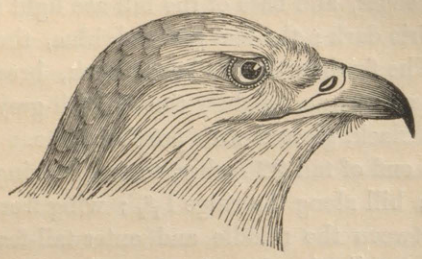


FIG. 222.

Falco furcatus. Linn. Syst. Nat. I. 129.
Falco furcatus. Lath. Ind. Orn. I. 60.
Swallow-tailed Elanus. Elanus furcatus. Selb. Illustr. I. 77.
Milvus furcatus. Jen. Brit. Vert. An. 86.
Swallow-tailed Hawk. Falco furcatus. Aud. Orn. Biogr. I. 368; V. 371.
Nauclerus furcatus. Audub. Synops. 14.

Head, neck, and lower parts white; back, wings, and tail black.

MALE.—This beautiful bird is at once distinguished from all the British falconine species by its very long and deeply forked tail, as well as by its peculiar colouring. It agrees in every respect with the generic character, it being in fact the only species of its genus known to me. The œsophagus of an individual which I examined for Mr Audubon measured five inches and a half in length, and one inch in width throughout; the stomach was two inches and a quarter in diameter; the intestine twenty-two inches long, and from five-twelfths to three-twelfths in width; the rectum three inches and a half in length, and its cloacal dilatation one inch in diameter. In another individual, the intestine was twenty-two inches long.

The very short, thick tarsi, strong, scutellate and tuberculate toes, and long taper-pointed claws, entirely unfit it for walking, and its extremely elongated wings and tail render it more aërial in its habits than any other of this essentially aërial tribe of birds. The feathers are oblong and rounded, but unless on the back and wings blended. The first quill is equal to the fifth, the second shorter than the fourth, and the third longest.

The cere, edges, and base of the bill are light blue, the rest black; the iris dark; the feet greenish-blue, the claws flesh-coloured. The feathers of the head, neck, breast, and other lower parts, are white, slightly tinged with grey; the rest of the plumage black, glossed with purplish-blue.

Length to end of tail 22 inches, to end of wings 19; extent of wings 47; bill along the ridge $1\frac{2}{12}$; wing from flexure 18; difference between the middle and outer tail-feathers 8; tarsus $1\frac{1}{4}$; first toe $\frac{5}{12}$, its claw $\frac{6}{12}$; second toe $\frac{6}{12}$, its claw $\frac{8}{12}$; third toe $\frac{11}{12}$, its claw $\frac{7}{12}$; fourth toe $\frac{7}{12}$, its claw $\frac{5}{12}$.

Female.—The female is distinguished from the male only by her superior size.

Habits.—The proper country of this bird is the tropical and temperate regions of America. In summer it seldom advances farther northward than Kentucky and Virginia, so that notwithstanding its buoyant and rapid flight, its occurrence in Britain is calculated to excite some surprise. An individual is recorded by the late Dr. Walker, Professor of Natural History in Edinburgh, to have been killed at Ballychulish in Argyllshire, in 1772; and another was caught in Shawgill, near Askrigg, in Wensleydale, in Yorkshire, in September 1805. As the Scottish specimen does not appear to have been preserved, and that obtained in England made its escape a month after its capture, it might be doubted whether the species has a decided claim on our recognition, were it not that we can hardly suppose it to have been mistaken in either case, its form and colouring being so peculiar. For its habits and distribution reference must be made to the Ornithological Biography of Mr Audubon,

Swallow-tailed Nauclerus.

he being the only person who has described them from observation. The following condensed statement will be found to contain all that is necessary for our purpose.

The Swallow-tailed Hawk is not uncommon in Texas. In the States of Louisiana and Mississippi, where it arrives early in April, it is abundant; in the large prairies of the Attacapas and Appellousas it is extremely common; in Florida and Virginia it is of rare occurrence; it is sparingly met with in South Carolina, and has been seen once or twice in Pennsylvania. Its flight is singularly beautiful, its motions in the air combining the utmost grace and ease. "Gliding along in easy flappings, it rises in wide circles to an immense height, inclining in various ways its deeply forked tail, to assist the direction of its course, dives with almost the rapidity of lightning, and, suddenly checking itself, reascends, soars away, and is soon out of sight. At other times a flock of these birds, amounting to fifteen or twenty individuals, is seen hovering around the trees. They dive in rapid succession amongst the branches, glancing along the trunks, and seizing in their course the insects and small lizards of which they are in quest. Their motions are astonishingly rapid, and the deep curves which they describe, their sudden doublings and crossings, and the extreme ease with which they seem to cleave the air, excite the admiration of him who views them while thus employed in searching for food. They always feed on the wing. In calm and warm weather, they soar to an immense height, pursuing the large insects called musquito-hawks, and performing the most singular evolutions that can be conceived, using their tail with an elegance of motion peculiar to themselves. Their principal food however is large grasshoppers, grass-caterpillars, small snakes, lizards, and frogs. They sweep close over the fields, sometimes seeming to alight for a moment to secure a snake, and holding it fast by the neck, carry it off and devour it in the air. They are very fond of frequenting the creeks, which in that country are much encumbered with drifted logs and accumulations of sand, in order to pick up some of the numerous water-snakes which lie basking in the sun. At other times they dash along the trunks of trees, and snap off the

pupæ of the locust, or that insect itself. Although when on wing they move with a grace and ease which it is impossible to describe, yet on the ground they are scarcely able to walk." In the stomach of one which I opened in the presence of Mr Audubon were six slender light green snakes, one of them twenty-two and a half inches in length, together with a large larva, three inches long, and two coleopterous insects. In another, the stomach contained a green snake nineteen inches long, six lizards, and four very large coleopterous insects, with two eggs of reptiles seven twelfths and a half long.

"The Swallow-tailed Hawk pairs immediately after its arrival in the Southern States, and as its courtships take place on the wing, its motions are then more beautiful than ever. The nest is usually placed on the top branches of the tallest oak or pine tree, situated on the margin of a stream or pond. It resembles that of Corvus Americanus externally, being formed of dry sticks, intermixed with Spanish moss, and is lined with coarse grasses and a few feathers. The eggs are from four to six, of a greenish-white colour, with a few irregular blotches of dark brown at the larger end. The male and the female sit alternately, the one feeding the other."

Young.—"The young are at first covered with buff-coloured down. Their next covering exhibits the pure white and black of the old birds, but without any of the glossy purplish tints of the latter. The tail, which is at first but slightly forked, becomes more so in a few weeks, and at the approach of autumn exhibits little difference from that of the adult birds. The plumage is completed the first spring."

Genus VIII FALCO. FALCON.

The Falcons are by most ornithologists considered the typical birds of the great family to which they belong, or those possessing in the greatest perfection the peculiar characters by which the second group of the diurnal rapacious birds is distinguished. It appears to me that there is little occasion for disputing the pre-eminence thus assigned to them. They are birds of small or moderate size, of a compact form, remarkably muscular, with the anterior part of the body very broad and deep; the neck short; the head large, round, and flattened above.

The bill short, very strong, of nearly equal breadth and height at the base, moderately compressed toward the end: upper mandible with a broad cere, the dorsal line convex from the base, the ridge rounded, the sides convex, the edges anteriorly thin and overlapping, with a medial festoon or convex prominence, and an anterior angular process, usually called a tooth, the tip trigonal, acute, decurved, with its lower part nearly perpendicular to the gape-line; lower mandible with the angle wide and rounded, the dorsal line very convex, the back broad and convex, the edges involute, with a rounded notch on each side near the tip, which is truncate.

Mouth wide; upper mandible internally nearly flat, with a prominent central line, lower deeply concave, with a slight ridge; palate flat, with two longitudinal soft, minutely papillate ridges. Tongue short, fleshy, concave above, sagittate and papillate at the base, with the sides nearly parallel, the tip rounded and emarginate. Œsophagus wide, with a large dilatation or crop; its walls thin, the inner coat smooth, when contracted forming longitudinal plicæ. Proventricular glands oblong or cylindrical, arranged so as to form a complete belt, somewhat marked with longitudinal depressions. Stomach

large, round, its muscular coat very thin, composed of a single series of fasciculi, its tendons rather large and round. Intestine of moderate length and width; cloaca elliptical or globular, very large; cœca very small. These organs are minutely described in Vol. I, p. 53, and illustrated by Plate IV, representing those of Falco peregrinus.

Nostrils sub-basal, lateral, round, with a central papilla or knob, connected with the upper edge by a thin plate. Eyes large, with the eyelids generally bare, but margined with bristly feathers like eye-lashes; the superciliary ridge prominent and bare. Aperture of ear round, and rather large. Legs of moderate length, stout; tibia rather long and very muscular; tarsus short, rounded, reticulated or covered with scales, of which the anterior are larger and subhexagonal. Toes strong, scutellate above, padded and papillate beneath; the first short, the third much longer than the fourth, which exceeds the second, and is connected by a basal membrane. Claws well curved, long, tapering to a fine point, a little compressed, rounded above and on the sides, flat beneath, with two sharp edges; those of the first and second toes largest.

Plumage generally compact, on the abdomen loose. Cere bare; space between the bill and eye covered with radiating bristle-tipped plumelets. Feathers of the head short and narrow, of the neck rather long, of the back and breast ovate or oblong, of the outer part of the tibia elongated. Wings very long and pointed; the second longest, the first little shorter; one or two of the primaries having the inner web abruptly cut out at the end; secondaries thirteen or fifteen, of moderate length, broad and rounded. Tail long, broad, rounded, of twelve broad, rather pointed feathers.

The Falcons, which are more compact and muscular than most of the other birds of this family, differ from them in their mode of flight, it being performed by regular beats, with little sailing or gyration, although they are capable of hovering or remaining fixed in a spot by means of rapid movements of the wings. They generally descend perpendicularly on their prey, which they capture in the air as well as on the ground. Their food consists of small quadrupeds, birds of various kinds, rep-

tiles, and insects. They breed on rocks, in trees, or on the ground, forming a bulky nest of sticks, twigs, and other coarse materials, and laying from three to six eggs, generally speckled or spotted with red or brown. The young are covered with thick white down. The difference in size between the male and the female is very remarkable in this genus; the sexes are sometimes similar in colour, and sometimes different, in which case the young resemble the female. The Falcons, on account of their docility, and their superiority of flight and mode of capturing their prey, were considered by falconers as "noble," while the other hawks and the eagles, being less easily induced to relinquish their natural habits, were termed "ignoble." Being for the most part very destructive to game, they are much persecuted with us; but in this respect they differ little from their brethren, every hawk being considered by the game-keeper as a malefactor.

Six species occur in Britain: the Gyr Falcon, the Peregrine Falcon, the Hobby, the Merlin, the Red-footed Falcon, and the Kestrel.

1. FALCO GYRFALCO. Linn. THE GYR FALCON.

JER FALCON. JERKIN. ICELAND FALCON. GREENLAND FALCON.



Fig. 223.

Falco rusticolus. Linn. Syst. Nat. I. 125. Adult.
Falco Gyrfalco. Linn. Syst. Nat. I. 130. Adult.
Falco islandicus. Lath. Ind. Orn. I. 32. Adult.
Falco Gyrfalco. Lath. Ind. Orn. I. 32. Adult.
Falco sacer, B. Lath. Ind. Orn. I. 34. Adult.
Jer Falcon. Mont. Orn. Dict.
Faucon Gerfaut. Falco islandicus. Temm. Man. d'Orn. I. 17 ; III. 9.
Jer-Falcon. Falco islandicus. Selb. Illustr. I. 36.
Falco Islandicus. Jer-Falcon. Jen. Brit. Vert. An. 81.

Adult of both sexes white, having the upper parts marked with semilunar or sagittiform dark-grey spots ; the bill light blue, the cere and feet pale-yellow. Young brownish-grey above, spotted with yellowish or reddish-white, the tail with numerous light bars, which on the middle feathers are generally opposite, but sometimes alternate, the lower parts yellowish-white, longitudinally spotted with dusky.

The Gyr Falcon, the most powerful, and one of the most beautiful species of its genus, has frequently been met with in various parts of Scotland, as well as in England, although it can scarcely be considered as a permanent resident, there being no authentic account of its breeding with us. Formerly it was divided into several species, and ~~very~~ recently attempts have been made to separate its members into two, under the names of Iceland Falcon and Greenland Falcon. Of the differences which have given rise to this opinion some account will be given in the sequel; and as, in such a case as this, minuteness of description is especially necessary, I shall give a full account of the several specimens which I have examined.

Male.—The general appearance of this bird is indicative of the highest degree of activity and vigour, its form being remarkably compact and robust, its neck short, its head rather large, round, and flattened above. The bill is short, as broad as high at the base, with the dorsal line of the upper mandible decurved from the base, the sides convex, the edges thin and overlapping, with a slight festoon, and a distinct angular process, the tip trigonal, descending, acute, and rather short; the lower mandible with the angle formed by the separation of its crura very wide, the dorsal line convex, the back very broad at the base, the sides rounded, the tip directly truncate, with a nearly semicircular notch behind it on each side. Palate nearly flat, with two longitudinal papillate ridges; upper mandible with a prominent broad median ridge beneath; lower deeply concave. Cere of moderate breadth, and mostly bare. Nostrils basal, lateral, round, with a central prominent papilla terminating a ridge from the upper edge. Eyes large, with a bare projecting superciliary ridge; eyelids ciliated. Aperture of the ear rather large and roundish. Legs robust, rather short; tibia very muscular; tarsus feathered more than halfway down, its exposed part covered with scales, of which the anterior are larger, but not scutelliform; toes strong, of moderate length, padded and papillate beneath, scutellate above, unless toward the base, where they are scaly; the first toe short, the second much longer, and nearly as long as the fourth,

which is connected with the third by a rather large basal web. On the first toe are five, on the second ten, on the third eighteen, on the fourth ten scutella. Claws large, strong, well curved, somewhat compressed, flattened and marginate beneath, tapering to a fine point.

The plumage is compact. The space between the bill and the eye is covered with short bristle-tipped plumelets. The wings are long and pointed, of twenty-five quills; the first quill ten-twelfths of an inch shorter than the second, which is longest, and exceeds the third by a quarter of an inch, the fourth two twelfths shorter than the first, which has the inner web abruptly attenuated toward the end; the second also attenuated, but without a notch, as is the third in a less degree. The secondaries are rather short, and most of the outer have a terminal sinus or slight notch on the inner web. Tail long, straight, slightly rounded, of twelve broad feathers, which at the end taper to a point.

Bill very pale blue, at the end darker, at the base pale yellow; cere, superciliary ridge, and edges of eyelids yellow; feet pale yellow, the bases of the digital scutella blue; claws bluish black. The general colour of the plumage is white; the forehead, cheeks, throat, tibial feathers, abdomen, and lower and upper tail-coverts unspotted. On the rest of the lower parts each feather has a small guttiform greyish-brown spot. The tips of the bristles about the base of the bill are dusky. On the upper part of the head and neck each feather has a linear-lanceolate streak; on the back and wings each has a subterminal cordate, generally pointed, or sagittiform spot of dusky-grey. The quills and their coverts are barred with that colour; the outer primaries greyish-black toward the end, and with the bars on their inner webs not extending to the margin. The tail is white, with the exception of seven spots toward the edges of both webs of the two middle feathers. These spots are not all exactly opposite to each other, some of them being alternate.

Length to end of tail 21 inches; bill along the ridge $1\frac{5}{12}$; wing from flexure $15\frac{1}{2}$; tail 9; tarsus $2\frac{1}{2}$; hind toe $\frac{11}{12}$, its claw $1\frac{1}{4}$; second toe $1\frac{4}{12}$, its claw $1\frac{2}{12}$; third toe 2, its claw 1; fourth toe $1\frac{4}{12}$, its claw $\frac{11}{12}$.

The above description is taken from the skin of an individual obtained in Shetland.

Female.—The female is much larger than the male, but scarcely differs in colour. The following description is taken from the individual figured by Mr Audubon, which was at least seven years old, and was procured in Iceland. The festoon on the edge of the upper mandible distinct, but the angular process or tooth in a great measure worn down. All the other characters as above; the second quill longest, the third two-twelfths shorter, the first three quarters of an inch shorter than the second; the tail slightly rounded, the lateral feathers being three quarters of an inch shorter than the longest. The bill is very pale blue, the upper mandible black at the end, the lower yellow; the cere, superciliary ridge, edges of eyelids, tarsi, and toes pale yellow; the claws black. The general colour of the plumage is white; the feathers of the back, the scapulars, the wing-coverts, and the secondary quills with a greyish-black, generally arrow-shaped spot near the end. The anterior dorsal feathers have also a dark shaft-line, those farther back a lanceolate streak, and those on the rump a similar streak with an additional spot. The primary quills have seven partial bars toward the end, besides a large subterminal space of the same dark colour; and the secondary quills and coverts have three or four bars or spots; the shafts of all the quills dusky above, as are those of the two middle tail-feathers, which have eight spots on the inner, and four on the outer margin. On the lower parts are no markings excepting a few lanceolate streaks on the sides, and on the elongated tibial feathers.

The œsophagus seven inches and a half long, of great width, dilated into a large crop; proventricular glandules oblong, arranged into four very prominent longitudinal ridges, with deep grooves between them. The stomach round, compressed, about an inch and a half in diameter; its muscular coat thin, and composed of a single series of large fasciculi; its inner coat soft and irregularly rugous; the pylorus with three knobs. The intestine is thirty-six and a half inches in length, from five

twelfths to four-twelfths in width, until the rectum, which is three inches and a half long, half an inch in width at the commencement, and dilated into a globular sac two inches in diameter; the cœca only two-twelfths long.

Length to end of tail $23\frac{1}{2}$ inches, to end of wings $21\frac{1}{2}$; extent of wings $51\frac{1}{4}$; wing from flexure 17; tail $9\frac{3}{4}$; bill along the ridge $1_{\frac{5}{12}}$; tarsus $2_{\frac{4}{12}}$; hind toe $1_{\frac{1}{12}}$, its claw $1_{\frac{5}{12}}$; middle toe $2_{\frac{1}{12}}$, its claw $\frac{1}{12}$, but worn.

Variations.—The only variations that present themselves in the adult state refer to the greater or less extent of the dark markings, which are sometimes entirely wanting on the head, neck, and tail. They are precisely analogous to those seen in the Snowy Owl, and require no particular description, although on paper slight differences of this kind have a formidable appearance.

Habits.—The Gyr Falcon has been met with by various observers in Norway, Sweden, and several of the northern countries of Europe; in Iceland, Greenland, Labrador, and the Fur Countries of North America. It breeds in the arctic regions, and presents itself in the temperate parts of Europe only as an occasional visitant, and generally in winter. When falconry was in vogue, it was procured in Iceland and Norway, the birds from the former country being more highly esteemed, and by some considered as of a different kind from those obtained in the latter. Mr Lachlan — p. 738.

Of its habits in the wild state little is known to ornithologists, and it does not appear that in Britain they have ever been the subject of observation to any person capable of describing them. Mr Audubon, who found it breeding in Labrador, where he obtained two specimens, states that its flight resembles that of the Peregrine Falcon, but is more elevated, majestic, and rapid. "They rarely sailed when travelling to and fro between their nest and an island where multitudes of Puffins were breeding, and to which they daily resorted, but used a constant beat of their wings. When over the Puffins, and high in the air, they would hover almost motionless, as if watching the proper

moment to close their pinions, and when that arrived, they would descend almost perpendicularly on their unsuspecting victims. Their cries also resembled those of the Peregrine Falcon, being loud, shrill, and piercing. Now and then they would alight on some of the high stakes placed on the shore as beacons to the fishermen who visit the coast, and stand for a few minutes, not erect like most other hawks, but in the position of a Lestris or Tern, after which they would resume their avocations, and pounce upon a Puffin, which they generally did while the poor bird was standing on the ground at the very entrance of its burrow, apparently quite unaware of the approach of its powerful enemy. The puffin appeared to form no impediment to the flight of the hawk, which merely shook itself after rising in the air, as if to arrange its plumage, as the Fish Hawk does when it has emerged from the water with a fish in its talons." Only four individuals were seen, which were believed to be of one family. The nest, which was placed on a precipice, " was composed of sticks, sea-weeds, and mosses, about two feet in diameter, and almost flat."

Dr Richardson, who found it a constant resident in the Hudson's Bay territories, where it is named the Speckled Partridge Hawk and the Winterer, and where it usually preys on the Ptarmigan, although it also destroys Plovers, Ducks, and even Geese, gives the following anecdote illustrative of its boldness in defence of its young: " In the middle of June 1821, a pair of these birds attacked me, as I was climbing in the vicinity of their nest, which was built on a lofty precipice on the borders of Point Lake, in latitude 65½°. They flew in circles, uttering loud and harsh screams, and alternately stooping with such velocity, that their motion through the air produced a loud rushing noise. They struck their claws within an inch of my head. I endeavoured, by keeping the barrel of my gun close to my cheek, and suddenly elevating its muzzle when they were in the act of striking, to ascertain whether they had the power of instantaneously changing the direction of their rapid course, and found that they invariably rose above the obstacle with the quickness of thought, shewing equal acuteness of vision and power of motion."

The eggs are said to be similar to those of the Peregrine Falcon, but larger. It does not appear, however, that there is much certainty on this subject.

Young.—The skin of a young bird fully fledged, from Greenland, in my collection, may be described as follows. The bill is similar in form to that of the adult, but with the festoon of the upper mandible very slight; its colour pale blue, the base of the lower mandible yellowish, the tip of the upper bluish-black; the cere greenish-blue. The tarsi and toes are greyish-blue, the soles yellowish; the claws black. The general colour of the plumage on the upper parts is brownish-grey. On the forehead the slender feathers are edged with yellowish-white; on the upper part of the head and the hind-neck, all the feathers have a large oblong yellowish-white space on the inner web toward the end. These white markings are larger and more conspicuous on the hind-neck, most of the feathers on which have also a patch on the inner web toward the base. On the rest of the upper parts the feathers are narrowly margined with paler; the anterior dorsal feathers and small wing-coverts with two small marginal subterminal yellowish-white spots; the middle and posterior dorsal feathers similarly marked; and the upper tail-coverts with the spots approaching in form to bars. The first primary has twelve slight marginal spots on the outer web, and on the inner fifteen transverse indentations which do not reach the shaft; the inner webs of all the other quills barred in the same manner, but the outer without markings. The tail is also barred, there being on the two middle feathers twelve, on the lateral fifteen bars, or series of transverse narrow spots, on both webs, which, although opposite to each other on the middle feathers, do not meet or run into the shaft, and toward the lateral become more oblique, and sometimes are not opposite; the tips white, or formed of two confluent spots of that colour. The lower parts are yellowish-white, longitudinally marked with linear-oblong brownish grey bands; the long feathers on the sides and legs, and the axillars, with the dark part larger, and the inner web with one or more light patches or spots. A small part of the throat without spots,

and the lower tail-coverts with only the shaft and a narrow oblong space toward the end dark.

Length to end of tail 21 inches; wing from flexure 15; tail 9; bill along the ridge $1\frac{1}{4}$; tarsus $2\frac{5}{12}$; middle toe $1\frac{11}{12}$, its claw 1.

Progress toward Maturity.—In the next stage, as it would appear, the upper parts become of a more uniform bluish-grey, most of the whitish spots having disappeared from the back, and upper part of the head. Of this kind were the two birds figured by Mr Audubon, and obtained by him in Labrador, as mentioned above. In this state also I have examined the skin of a female from Shetland. In one of these the light bars on the tail had nearly disappeared; but in the two females they were quite distinct, and those on the middle feathers opposite, though not continuous. In the Shetland specimen, which is apparently a female, its length being twenty-four inches, the lower parts are yellowish-white, with longitudinal oblong, brownish-grey spots; the upper parts slate-grey tinged with brown, the feathers margined with paler; the bill light blue, dark at the tip, and yellowish at the base; the feet blue, but with the edges of the scutella yellowish.

Dr Richardson, who no doubt has had opportunities of observing the changes which take place in the colouring, says:—"The young Gyr-falcons show little white on their plumage, being mostly of a dull brown colour above. As they grow older, the white margins encroach on the brown, which becomes merely a central blotch, indented on each side by the white; while in aged birds the plumage is mostly pure white, varied only by a few narrow transverse bars on the upper parts."

Remarks.—Mr Hancock, in a paper read to the British Association, and published in the Annals of Natural History, Vol. II. p. 241, is decidedly of opinion that two species have been confounded under the synonymous appellations of Jer or Gyr Falcon and Iceland Falcon. Both species, Falco Islandicus and Falco Grœnlandicus, he says, are precisely similar in their first plumage, with this exception, that the young F. Islandicus has the bars on the two middle tail-feathers "*non-con-*

tinuous, or not opposing each other, whilst they are continuous in the young F. Grœnlandicus." The distinctive characters which he assigns to the adult of these species are the following:

Falco Islandicus. Ground of the upper plumage a dark lead or mouse colour, barred and spotted with cream colour; (on the) under parts the ground is buff, marked with streaks, heart-shaped spots, and bars of dark mouse colour. Wings reaching to within about 1½ in. of the end of the tail. Adult male 1 foot 9 in.; extent of wings 3 feet 10 in. Adult female, length 1 foot 11 in.; extent of wings 4 feet 2 in.

Falco Grœnlandicus. Ground of the plumage pure white; upper parts elegantly marked with arrow-shaped spots of a dark grey; under parts and head streaked with the same; wings reaching to within 2 inches of the end of the tail; second primary the longest. Adult male, length 1 foot 9 in. Adult female, length 1 foot 11 in.; extent of wings 3 feet 10 in.

It is further stated that all the mature specimens from Iceland seen by the author, amounting to seven, have the upper mandible furnished with two processes, whilst in the many Greenland specimens examined, only two had the double process, and these were apparently very old individuals.

Without expressing any decided opinion upon the subject, I have to observe that analogically the alternation or continuance of the bars on the two middle tail-feathers is of no value as a character; for, having examined a great number of skins of Falco Tinnunculus, Falco Æsalon, Buteo vulgaris, Cuculus canorus, Eudynamis orientalis, and several other species having numerous bars on the tail, I find that in all of them the bars are sometimes continuous and sometimes alternating. In the Snowy Owl, the bird which most resembles the Gyr Falcon in its style of colouring, the bars are either direct or alternate. Unless therefore every one of these species is composed of two, there is no reason to believe that this character is sufficiently distinctive in the case of the Gyr Falcon. In the two adult "Greenland Falcons," one of which, however, was from Iceland, and that upon unquestionable authority, the festoon or second tooth was conspicuous, while in the younger individuals it is scarcely apparent. As to the difference of half an inch in

the comparative length of the wings and tail, it is obviously of no account, and cannot even be determined with certainty in skins. Farther observations, however, are necessary to determine whether the grey birds from Iceland, if kept several years, remain of the same colour or change to white.

Of all the describers of birds, Brisson seems to me to be the most accurate, and yet his Gyrfalco Islandicus, which he says is found in Iceland, is represented as having the bands on the two middle tail-feathers continuous, and the upper parts dusky spotted with whitish. The figure, however, is not correct in the form of the bill and several other particulars. But whether there be two species or not of Jer Falcons, I believe that those above described by me are all of one single species, of the many specific names given to which I think the best are those of *Gyrfalco* and *candicans*. Linnæus, whose specific names have the best claim upon us, named it Falco Gyrfalco, and referred to Brisson's figure and description, both of which represent an adult white bird. This name, therefore, ought unquestionably to be retained.

H. 2. FALCO PEREGRINUS. THE PEREGRINE FALCON.

BLUE HAWK. GREY HAWK. HUNTING HAWK. GOSHAWK. FALCON. COMMON FALCON. SHEABHAG.

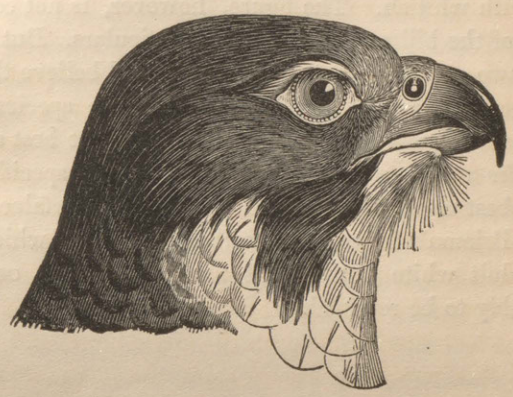


Fig. 224.

Falco peregrinus. Lath. Ind. Orn. I. 33. Adult.
Falco communis. Lath. Ind. Orn. I. 30. Young.
Faucon pélerin. Falco peregrinus. Temm. Man. d'Orn. I. 22; III. 11.
Peregrine Falcon. Mont. Orn. Dict.
Peregrine Falcon. Falco peregrinus. Selb. Illustr. I. 30.
Falco peregrinus. Peregrine Falcon. Jen. Brit. Vert. An. 82.

Wings when closed about half an inch shorter than the tail. Adult male with the head, hind-neck, and a broad band on the cheeks, black, the upper parts deep bluish-grey, fading behind into ash-grey, and barred with greyish-black, the lower parts white, the breast and sides transversely spotted and barred with dusky. Female with the upper parts more dusky, the lower reddish-white, with larger markings. Young with the upper parts deep brownish-black, faintly spotted with reddish, each feather tipped with light red, the lower parts yellowish-white, with longitudinal dusky streaks.

Equal in beauty of form, and little inferior in strength or spirit, the Peregrine Falcon is next in size to the species last described, and like it exhibits the peculiar characters of the genus in great perfection. It ranks next to the Gyr Falcon in the estimation of those who train rapacious birds for the chase, and, being the species usually employed in hunting the larger kinds of game, has obtained pre-eminently the name of Hunting Hawk. Although nowhere very numerous, it is extensively distributed in Britain, so that specimens are plentiful in museums and private collections.

Male.—In form the Peregrine Falcon is compact and robust, its body being ovate, anteriorly broad, with the breast full and well-rounded, the neck short, the head large, round, and rather flattened above. The bill is short, thick, and strong; the upper mandible with the cere rather short, the dorsal line curved from the base, the ridge convex but rather narrow, the sides convex, the edges with a slight festoon, and a prominent angular process, the tip trigonal, descending, and acute; the lower mandible with the angle broad and rounded, the dorsal line convex, as are the sides, the edges somewhat involute, the tip directly truncate, with a distinct sinus behind.

The interior of the mouth, the tongue, and the digestive organs having been minutely described at p. 53 of Vol. I, and figured in Pl. IV, it will here suffice to give the measurements of these parts in the individual selected for description. The œsophagus is six inches in length, an inch in width at its commencement, and presently dilating into a crop two inches in width; the stomach two inches and two-twelfths in length and breadth, its round central tendons three-eighths in diameter; the intestine three feet long, varying in width from three-eighths to two-eighths, but the rectum, which is three inches long, is wider, and dilates into a globular cloaca, an inch and a half in width; the cœca only a twelfth and a half in length.

The nostrils are round, a twelfth and a half in diameter, with a central papilla; the eyes large, their aperture four and a half twelfths; the eyelids bare, but ciliated, the projecting

supraocular ridge also bare; the aperture of the ear roundish-elliptical, four-twelfths in width. The feet are robust; the tibia of moderate length and very muscular, the tarsus short, feathered more than halfway down, and covered all round with reticular scales, of which the anterior are larger and subhexagonal; the toes large; the first rather long, with six scutella, the second longer, with nine, the third very long, with eighteen, the fourth longer than the second, with ten scutella, and connected with the third by a basal web. The claws are large, strong, well-curved, rounded above, considerably compressed, narrow and marginate beneath, with a fine taper point.

The plumage is very close and compact on the upper parts, less so on the lower; the feathers of the head short and oblong, of the back ovate and rounded, of the lower parts ovato-oblong and rounded, of the outer part of the tibia elongated. Even the abdominal feathers and lower tail-coverts are firm, and the plumage is altogether denser and stronger than that of any other British species of this family. The space between the bill and the eye is covered with bristle-pointed plumelets. The wings are pointed and very long; the quills twenty-three; the primaries of moderate breadth, narrowed toward the end, the first quill with a sinus on the inner web, and half an inch shorter than the second, which is longest, and exceeds the third by four and a half twelfths; the secondaries are broad, and obtuse, with an acumen. The tail is rather long, exceeds the wings by half an inch, and is slightly rounded, the middle feathers being three quarters of an inch longer than the lateral.

The bill is pale blue, toward the end bluish-black, tinged with yellow at the base, especially on the lower mandible; the cere oil-green, the bare orbital space orange-yellow, the iris dark hazel, the feet greenish-yellow, the claws bluish-black. The head, hind-neck, and a large mystachial patch on each side, are black, with a tinge of bluish-grey. The general colour of the upper parts is deep bluish-grey, on the back and tail-coverts fading into ash-grey; the dorsal feathers, wing-coverts, and tail-coverts barred with greyish-black. The primary quills are greyish-black, their inner webs marked with reddish-white bars, of which there are fourteen on the first

quill; the secondary quills lighter, their outer webs obscurely barred with dark grey, the inner barred like those of the primaries. The tail is greyish-blue, the middle feathers with eleven, the lateral with thirteen bars of greyish-black, those toward the base narrower and more grey, the last much larger, the tips white. The throat and sides of the neck are white, without markings; the general colour of the rest of the lower parts is white, on the sides of the body and outer part of the tibiæ tinged with grey; the fore-neck with very slender central streaks on the feathers; those on the breast at first lanceolate, then roundish, and lastly transverse; the sides and tibiæ distinctly barred with greyish-black; the bars on the sides of the rump, the lower tail-coverts, and abdomen fainter; the lower wing-coverts white, with dark bars.

Length to end of tail 16½ inches, to end of wings 16; extent of wings 36½; wing from flexure 12¼; tail 6½; bill along the ridge $1\frac{1}{1\frac{1}{2}}$, along the edge of lower mandible $1\frac{2}{1\frac{1}{2}}$; tarsus $1\frac{9}{1\frac{1}{2}}$; hind toe $1\frac{1}{1\frac{0}{2}}$, its claw $1\frac{1}{1\frac{1}{2}}$; second toe $1\frac{2}{1\frac{1}{2}}$, its claw $\frac{10\frac{1}{2}}{1\frac{1}{2}}$; third toe 2, its claw $\frac{9}{1\frac{1}{2}}$; fourth toe 1½, its claw $\frac{8}{1\frac{1}{2}}$.

Female.—The female, which is much larger, is easily distinguished by the tints of the plumage, which is reddish on the lower, and less blue on the upper parts. The proportions are similar; the diameter of the nasal aperture two-twelfths, of the eye five and a half twelfths, of the ear four-twelfths. The œsophagus is seven inches long, an inch and a quarter in width at the top, two inches and a half in the dilated part; the stomach two inches and three-fourths in diameter; the intestine forty-nine inches in length, its width in the duodenal part three-eighths, toward the end two-twelfths; the cœca a twelfth and a half in length; the cloacal dilatation of the rectum an inch and a half in width. The first quill is four-twelfths shorter than the second, which exceeds the third by half an inch.

The bill is greenish-yellow at the base, then pale blue, with the tip black; the cere and eyelids yellow; the iris dark hazel; the feet greenish-yellow, the claws bluish-black. The general colour of the upper parts is deep grey, of the head greyish-

black, its anterior feathers tinged with brown, the tint on the back lighter, on the rump ash-grey; the upper parts barred with greyish-black as in the male; the transverse spots or bars on the inner webs of all the quills reddish-white; the tail barred as in the male, with the tip reddish-white, and the subterminal dark bar proportionally larger. On the inner web of the first quill are fourteen spots; on the middle tail-feathers ten, and on the lateral thirteen dark bars. The cheeks and mystachial bands are greyish-black; the throat and sides of the neck reddish-white; the general colour of the lower parts reddish-white, richer on the breast, paler behind; the spots as in the male, but larger, and of a deeper black; the lower wing-coverts also more largely barred.

Length to end of tail 19½ inches, extent of wings 42½; bill along the ridge $1\frac{5}{12}$, along the edge of lower mandible 1¼; wing from flexure 14¾; tail 7½; tarsus $2\frac{1}{12}$; first toe 1, its claw $1\frac{1}{12}$; second toe $1\frac{2}{12}$, its claw 1; third toe 2¼, its claw $1\frac{1}{12}$; fourth toe $1\frac{7}{12}$, its claw $1\frac{0}{12}$.

Variations.—The above descriptions are from a male and a female shot on the Pentland Hills in January 1838, and now in my collection. Variations are observed in size, the males measuring from sixteen to eighteen inches in length, the females from eighteen to twenty-three. In colour, adult males vary little, the head being greyish-black or brownish-black, the bluish-grey of the back deeper or lighter, sometimes approaching to ash-grey behind; the fore-neck sometimes without streaks or spots, sometimes slightly marked; and the spots and bars on the breast and sides narrower or broader. The females are brownish-grey, greyish-brown, or blackish-grey above, seldom of so light a tint as the males, and generally more obscurely barred. They are always yellowish or reddish beneath, the tint on the breast being sometimes very rich. The intestinal canal varies considerably in length, as do the cœca, of which I have seen one wanting. The following table contains measurements of the digestive organs in different individuals.

	M.	M.	M.	F.	F.	F.	F.
Tongue in length...	—	$\frac{9}{12}$	$\frac{8\frac{1}{2}}{12}$	$\frac{9}{12}$	$\frac{9}{12}$	—	—
Œsophagus.....	6	6	$6\frac{1}{4}$	7	$6\frac{1}{2}$	$7\frac{1}{4}$	7
Width of crop.....	$2\frac{1}{2}$	$1\frac{9}{12}$	2	$2\frac{1}{2}$	—	2	$2\frac{1}{2}$
Stomach in diameter	$2\frac{2}{12}$	$1\frac{11}{12}$	2	$2\frac{3}{12}$	$2\frac{3}{12}$	$2\frac{2}{12}$	$2\frac{1}{4}$
Intestine in length...	36	36	38	49	51	54	50
Its greatest width...	$\frac{3}{8}$	$\frac{4\frac{1}{2}}{12}$	$\frac{4}{12}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{4}{12}$	$\frac{4}{12}$
Its smallest width..	$\frac{2}{8}$	$\frac{2}{12}$	$\frac{2}{12}$	$\frac{2}{12}$	$\frac{2\frac{1}{2}}{12}$	$\frac{2\frac{1}{2}}{12}$	$\frac{2}{12}$
Cœca in length.....	$\frac{1\frac{1}{2}}{12}$	$\frac{1\frac{1}{2}}{12}$	$\frac{1\frac{1}{2}}{12}$	$\frac{1\frac{1}{2}}{12}$	$\frac{1\frac{1}{2}}{12}$	$\frac{3}{12}$	$\frac{2}{12}$
Rectum.....	3	3	3	3	3	$3\frac{1}{2}$	—
Cloaca in diameter..	—	$1\frac{1}{4}$	—	—	—	$1\frac{1}{2}$	—

The scutella vary considerably, although less than in many species.

	M.	M.	M.	M.	F.	F.	F.	F.
First toe.....	6	6	6	7	6	7	6	7
Second toe.....	9	9	9	10	9	11	12	9
Third toe.....	18	17	17	16	18	17	18	18
Fourth toe.....	10	10	10	11	10	12	10	10

Changes of Plumage.—The moult takes place early in summer; but I think is not completed until November, for several specimens examined in that month exhibited young feathers about the head. Perhaps a renewal of parts of the plumage takes place in the Falcons, as in the Eagles, at all seasons. At all events, the plumage is perfect in the beginning of winter, and then all the feathers on the wings and back have a slight edging of paler. In summer the tints are much faded, and the feathers more or less worn and ragged.

Habits.—Although it seldom happens that one can have an opportunity of seeing much of this beautiful Falcon, unless he watch it in one of its breeding places, it is not difficult in Scotland to become in some degree acquainted with it, for even at the present day, after unrelenting war has been waged against the rapacious birds for many years, the Blue Hawk is not remarkably scarce with us. In Edinburgh more specimens are annually prepared than of any other species, excepting the

Sparrow Hawk, Kestrel, Merlin, and Buzzard. I have examined about fifty individuals, of which more than ten were recent and entire, so that if my descriptions are not correct, I deserve the censure of "the candid critic." My opportunities of studying the living birds have enabled me to offer the following remarks.

The flight of the Peregrine Falcon is very rapid, being performed by quickly repeated beats, much in the manner of the Rock Dove. In searching for prey, it does not fly so low as the Sparrow Hawk or Hen Harrier, nor does it glide among trees, but keeps to the open country, scouring the hills and moors, and, on discovering a fit object, pouncing upon it in perpendicular or slanting descent, or pursuing it in direct flight, but always keeping above its quarry until a favourable opportunity of clutching it occurs. It may be occasionally seen balancing itself in the air, but it seldom floats or as it were sails in circles, like the Eagles, Buzzards, and other rapacious birds which have long, broad, and rounded wings. Its speed must be very great, and has been variously estimated at sixty or a hundred and fifty miles an hour, and yet it does not much exceed that of a Pigeon. Even a Grouse, which the closet-naturalists tell us is ill adapted for rapid flight, is not overtaken by a Peregrine in a moment. I have in my mind a vivid picture of a chase which I witnessed on the Pentland Hills. One day when reclining among the heath I was aroused by a sudden noise, and on looking up observed two Red Grouse advance over an eminence and shoot obliquely downward across the face of the hill with marvellous speed, and without uttering any cry, although there was a loud sound from their wings. As I was wondering what could be the cause of all this headlong hurry, a Peregrine Falcon appeared on the eminence, and shot along with easier and more rapid flight, after the grouse, which soon disappeared round the hill, so that I could not see the result of the chase. The Brown Ptarmigan or Red Grouse, and the Grey Partridge are with us its favourite victims; but it also feeds on Black Grouse, Pheasants, Mallards, Teal, Pigeons, Gulls, Puffins, Auks, Guillemots, rabbits, and young hares. It has been seen to feed upon a dead sheep, but this

~~Although it never ventures to perform any remarkable~~
~~feat of audacity in defence of its nest, when man is the aggressor it allows no other creature to approach, whereas the~~
eagle. Although, when man is the aggressor, it seldom ventures
to perform any remarkable feat of audacity in defence of its
nest, it allows no other creature having the power of inflicting
injury to appear in its immediate neighbourhood. Its affec-
tion for its young is great, and its solicitude for their safety
conspicuous, while its endeavours to procure for them an
abundant supply of food are unceasing and wonderfully
successful, inasmuch as the vicinity of the nest is often seen
strewed with carcases which they have been unable to de-
vour. I am indebted to the Revd. Mr. Broadfoot, minister
of Euchen, for the following affecting instance of that natu-
ral affection for their young which warms the breast even
of the fiercest of the feathered tribes. Towards the head of Eu-
chen Water, in the range of the Moffat Hills, are some rocky
heights well known in the district as a favourite haunt of
several kinds of rapacious birds. During the breeding season
of 1840, a pair of Peregrine Falcons having built their nest on
one of these cliffs, the female bird met her death under the fol-
lowing circumstances. The gamekeeper of the bounds, stealing
round a corner of the cliff, fired at her as she sate on her
nest, and evidently wounded her, though not so severely
but that she was able to fly to some short distance and
conceal herself among the heather, so that she could
not be found. But the next day a shepherd who had been
directed to the place to renew the search found the noble
bird seated on her nest dead and cold; her young under
her dead too; and they and the nest all coloured with
the blood that had flowed from her wounds. The same
maternal tenderness displayed by a human mother
would have filled our eyes with tears: nor need we be

Falco peregrinus. Peregrine Falcon.

greatly ashamed of our emotions though we shed a tear at the fate of this poor bird. The name of the game keeper is Thomas Gray, that of the shepherd Thomas Smail both men whose word may be relied on. The ill-fated falcon has been stuffed, is the property of Adam Sim Esq. of Coltenmains, and now stands before me as I write. It requires no great stretch of fancy to imagine that she still wears a look of that dumb agony that must have embittered her last moment." Yet O Falco perox, how many motherless heath fowls hast thou caused to perish of cold and hunger on the wieds of Moffat dale, how many affectionate mothers hast thou torn from their lamenting broods, how many gallant but hapless sewit and plover, and hast thou squeezed to death with thy merciless grasp. Men mourn over the fallen tyrant and conqueror, the hero of a thousand fights, but when the obscure victim of his insatiable lust of power and renown sinks into the grave, sighs may come from the bosom and tears may flow from the eyes of some equally obscure friend: but to the world what are his tears and sighs, when compared with the sorrows of him who has climbed to Fame's proud temple.

sort of food appears to be less palatable to it than to Eagles and Buzzards. Although not addicted to committing depredations among domestic poultry, it sometimes manifests little regard for the proximity of man, and has been known to snatch a wounded bird from before the sportsman. For the most part it is solitary and silent, pursuing its avocations as if little disposed to pay attention to any thing else; but sometimes a pair hunt together, and in the breeding season it is rather clamorous in its rocky haunts, emitting a loud, clear, and shrill cry, like that of the Kestrel. It has few enemies besides man, for none of our native birds seem capable of injuring it, and it is so bold as sometimes to attack the Eagle, should he approach its domain. With its rapid and gliding flight, it forms a less conspicuous object than the Buzzard, which, as it floats slowly along, presents a more interesting feature in the wild scenery of our hilly ranges.

Under ordinary circumstances it is shy and vigilant, so that one seldom finds an opportunity of shooting it; but at its breeding place it is in general easily approached, as the female is not readily put from the nest, and the male flies around, uttering loud screams. No instance is recorded of its breeding in trees, the nest being always placed on the face of a maritime cliff or inland precipice, generally beyond the reach of man, unless with the aid of a rope. It is bulky, and composed of sticks and herbaceous plants, varied according to the locality. Thus, in the Bass Rock, it is formed solely of grass and other soft materials, there being no ligneous plants there. The eggs, three or four in number, are of a broadly elliptical form, two inches or a little more in length, and about an inch and seven twelfths in breadth, dull light red, dotted and patched with darker red. The young, which are at first covered with white down, are abundantly supplied with food. So great is the strength of this bird that, according to the keeper of the Bass Rock, it has been known to carry to its nest there at one time a male Black Grouse, and at another a Pheasant. Auks, Guillemots, Kittiwakes, various sea birds, Plovers, Pigeons, and Brown Ptarmigans, are the food usually brought to the young in that place.

*

"In May 1839," says my son John, "I fell in with a nest of the Peregrine in one of a range of cliffs in the neighbourhood of Tantallon, on a bold headland, the most projecting part of the coast. It was situated on a shelf, at the distance of about forty feet from the base of the cliff, and above it was a precipice of about sixty feet or more. From its situation, owing to a portion of the crag which formed an arch over it, and prevented inspection from above, as well as the abruptness of the neighbouring rock, it seemed perfectly secure from all intruders; but from a rock in the sea immediately opposite, a good view of it could be had. It was constructed externally of sticks and sea weeds, which formed a mass about two feet in diameter. The rock around it was profusely covered with white patches of dung. In the course of the same afternoon I saw a fine female Peregrine which had been shot that day by the gamekeeper at Dirleton. I was informed by him that he had killed it at sea close to a small island, nearly opposite North Berwick, on which, as well as on the Bass, a pair annually breed. When killed it had a partridge in its talons."

"In Shetland," says Mr Dunn, "it selects the most mountainous parts, where it can settle on the shelving rocks of the stupendous cliffs, and breed in security in the midst of plenty; it is rare that more than a single pair have their nest on the same cliff, or even near to each other. I once found two pairs during the breeding season on Noss Head or Hang Cliff; and a better place they could not have chosen, from the security it affords and the abundance of food which the nests of the sea-birds, abounding in the same rocks, supply them with. During my visits I captured several specimens of the Peregrine Falcon, and also procured some of their eggs. It is a shy bird, and difficult to get within shot of. I have repeatedly lain in wait for it on the tops of the cliffs, and observed it flying slowly along the face of the rocks immediately below me, but out of distance, watching the opportunity during the absence of the Herring Gulls and Kittiwakes, to pick a young one from their nests, which it frequently does with great dexterity. I know of no certain method of decoying this bird; the way in which I obtained my specimens was by first finding out their breed-

ing-place, and then lying in wait for and shooting the birds as they flew to and from their nests."

The breeding places which I have seen are in the island of Pabbay, Berneray of Barray, the Bass Rock, ~~and~~ the rocks at the head of Moffatdale. Tantallon Castle rock, St. Abb's Head, and the Isle of May are also mentioned as nesting places. In Shetland it is not uncommon, according to Dr Edmondstone and Mr Dunn; and as it usually bears the name of Goshawk, it is probable that Mr Low alludes to it as occurring in Orkney under that appellation. In the northern ranges, as well as in the Grampians, it is not unfrequently met with; but it seems to be more abundant in Peebles-shire and the adjoining mountainous districts of the counties of Selkirk and Dumfries, than in most parts of Scotland; so that although it often breeds on maritime cliffs, this habit is not determined by any predilection for the sea. In some of the northern districts of England, and in Wales, it is also here and there met with. The Isle of Wight, several parts of Devonshire and Cornwall, Holyhead, and some other places of resort are mentioned in that country, in the low and cultivated parts of which, however, it is very uncommon. According to Mr Thompson, it occurs in suitable localities throughout Ireland.

Foulsheugh near Dunottar castle and a rock south of the Cove, near Auldon.

My friend Mr Hepburn has favoured me with the following notes. "Some years ago, when I frequently rambled amongst the wild moors in the northern parishes of Peebles-shire, and about the head waters of the Clyde, I almost daily saw the Goshawk, as the country people call the Peregrine Falcon, hunting about in quest of Red Ptarmigans and Partridges, to the former of which he is said to be very destructive. Mallards and Teal also constitute part of his food. In East Lothian I have not met with it on the Lammermoors, and but seldom on the sea-coast. A gamekeeper in this neighbourhood, when going his rounds one day, observed a Peregrine Falcon, after a rapid pursuit, drive a Pheasant dead to the ground. On finishing a meal he departed; and the keeper, after fixing the carcase to the ground with pegs, went home for a trap, which he placed near the dead bird in such a way that nothing could reach it without either removing or springing

the trap. Some hours after the Falcon arrived, alighted near his prey, examined the barrier, and essaying the entrance, touched the fatal spring, and was a prisoner. It frequently preys on the domestic pigeon, either driving it to the ground, or trussing it in the air, and carries it off to some quiet place. In this district it usually goes by the name of King Hawk."

Mr Thompson, in the second volume of the Magazine of Zoology and Botany, gives a number of very interesting anecdotes illustrative of the habits of this bird, one of which I take the liberty of transferring to this page. "Mr Sinclaire, when once exercising his dogs on the Belfast mountains, towards the end of July, preparatory to grouse-shooting, saw them point, and on coming up he startled a male Peregrine Falcon off a grouse (Tetrao Scoticus) just killed by him, and very near the same place he came upon the female bird, also on a grouse. Although my friend lifted both the dead birds, the hawks continued flying about, and on the remainder of the pack, which lay near, being sprung by the dogs, either three or four more grouse were struck down by them, and thus two and a half or three brace were obtained by means of these wild birds, being more than had ever been procured out of a pack of grouse by his trained falcons." This is a striking example of the disregard for the presence of man which a very shy bird will occasionally exhibit when impelled by the cravings of appetite. An eagle has seized a domestic fowl almost in the midst of a number of people, and another has carried off a grouse just disabled by a shot; and yet were one to attempt to approach an eagle when not occupied, he would find his endeavours fruitless.

The Peregrine Falcon appears to be at least as common in North America as in Europe. The birds of both regions are those which have been most minutely and correctly described, and it is to a Scotchman that the world is indebted for the first accurate account of those of the United States. Wilson, however, knew very little of the Peregrine Falcon, which has been better studied by his successor Mr Audubon, who states that in America its habits are precisely the same as in Europe. "Having arrived within a few feet of the prey, the Falcon is seen

protruding his powerful legs and talons to their full stretch. His wings are for a moment almost closed; the next instant he grapples the prize, which, if too weighty to be carried off directly, he forces obliquely toward the ground, sometimes a hundred yards from where it was seized, to kill it, and devour it on the spot. Should this happen over a large extent of water, the Falcon drops his prey, and sets off in quest of another. On the contrary, should it not prove too heavy, the exulting bird carries it off to a sequestered and secure place. He pursues the smaller Ducks, Water-hens, and other swimming birds, and if they are not quick in diving, seizes them, and rises with them from the water. I have seen this hawk come at the report of a gun, and carry off a Teal not thirty steps distant from the sportsman who had killed it, with a daring assurance as surprising as unexpected." In Labrador and Newfoundland, where he found it more abundant than elsewhere, "the nests were placed on the shelves of rocks, a few feet from the top, and were flat, and rudely constructed of sticks and moss. In some were found four eggs, in others only two, and in one five; in one nest only a single young bird was found. The eggs vary considerably in colour and size, which I think is owing to a difference of size in the females, the eggs of young birds being smaller. The average length of four was two inches, their breadth an inch and five-eighths. They are somewhat rounded, though larger at one end than the other; their general and most common colour is a reddish or rusty yellowish-brown, spotted and confusedly marked with darker tints of the same, here and there intermixed with lighter. The young are at first thickly covered with soft white down. They take food almost immediately after being removed from the nest. Remains of Ducks, Willow Grouse, and young Gulls were found about the nests, which are easily discovered by the excrements on the rocks."

In the olden times, when ferocious feuds afforded occupation to the nobility, and when even the pursuits of peaceful days had reference to bloodshed, hawking was a favourite amusement with those whose rank entitled them to engage in it. Various species of predatory birds were trained for this

purpose, and among the most esteemed was the Peregrine Falcon, which being easily procured, remarkable for docility, and by its expertness in the art of destruction well qualified to afford amusement, not to barons bold only, but to gentle dames, was the kind commonly employed. The female, or Falcon properly so called, was flown at Herons, Geese, Ducks, and in general the larger sorts of birds, while to the male, who, from being about a third smaller, was called the Tiercel or Tiercelet, were allotted partridges and other small game. When old the bird was a Hagard, when well trained and handsome a Gentle Falcon (bien fait, bien dressé, d'une jolie figure), when in its first plumage a Red Falcon. Many other names were employed, which, having been taken up by the ornithologists, gave rise to much misconception; although of late years the intricacies resulting from the errors of describers have been unravelled, and the Peregrine Falcon in all its stages is now simply the Peregrine Falcon. It is from this species that the art of Falconry derives its name, although it appears that two others, superior in size, and at least equal in courage and strength, were employed, namely, the Iceland or Gyr Falcon, also named the White Falcon, and the Lanner. "The Falcon," says Buffon, "is perhaps the most courageous of all birds in proportion to its size; it throws itself directly and perpendicularly upon its prey, whereas the Goshawk and most other birds of prey come laterally upon it; it falls like a shot upon its victim, kills it, eats it on the spot if it be large, or, if it be not too heavy, carries it off rising perpendicularly. It is seen all of a sudden pouncing upon its prey, as if it fell from the clouds, for it comes from such a height, and in so short a time, that its appearance is always unforeseen, and often unexpected. It is frequently seen to attack the Kite, but it treats him as a coward, chases him, strikes him with disdain, and does not put him to death." Although ~~the eloquent Count~~ is not always to be trusted, such, according to other ~~authors~~, is the style of hunting of the Falcon, which in pursuing its prey advances directly towards it, keeping above its level, and suddenly closing its wings, dashing down upon it, and either clutching it and bearing it away, or driving it to the ground, or in the

case of a large bird, as the Heron, grappling it and descending with it. It is not by coming against it with its breast, nor by hitting it with its wings, nor by tearing it with its bill, that it destroys its prey, but by grasping it with its long toes, and thrusting into its vitals its curved and pointed claws. The art of Falconry has of late years been partially revived.

Since the above was in types I have been favoured by Mr Weir with the following note:—"That the Peregrine Falcon is able to carry a weight nearly equal to its own, and that for a distance of a considerable number of miles, is proved by the following fact. Mr George Craven, gamekeeper to P. G. Skene, Esq. of Pitlour, Fifeshire, informed me that in the first week of June 1829 he took out of one of their nests, which he discovered in the Isle of May, an old cock Red Grouse. He likewise saw the bones of several birds of the same species. He also informed me that the female generally lays her eggs in April, and that they are two, three, and sometimes four. They have usually two young ones, and seldom three. They sit on the eggs one month. The young are ready to be taken for taming in the second week of June, and are able to fly about the beginning of July. For some time past he has been in quest of them for the Duke of St Albans, who is Falconer to her Majesty. These falcons he says are now very scarce, there being only one pair for four which he has formerly seen. Almost all the former breeding places have been unproductive these two last years. The places in which he has seen eyries are the Isle of May, the Bass Rock, King Craig near Kilconquhar, the Lomonds, the rock at Newburgh, Benerty Rock near Kinross, Glenturit, and many parts of the Highlands."

Young.—The young when completely fledged are as follows. The bill is light greyish-blue, with only a small portion of the tip dusky, the edges of the upper mandible, and the base of the lower yellowish; the cere greenish-blue; the iris dark brown; the feet greyish-blue, tinged with yellow, and the edges of the scutella yellowish; the claws brownish-black. The upper parts are deep greyish-black, all the feathers marginally tipped with light red; those on the nape with a large portion of that

colour, of which there is also a band over the eyes. The feathers gradually become grey toward the base; the scapulars have several light red spots toward the margins; the primaries are black, their inner webs marked with transverse light red spots, of which there are ten on the first quill; the secondaries are similarly marked on their inner webs, and on the outer have very inconspicuous spots of the same. The tail is black, shaded with grey, tipped with reddish-white, and barred with spots of light red, of which there are five on each web of the middle feathers, and seven on those of the outer, the spots on the outer webs being small and roundish, on the inner transverse. The mystachial band is black; the lower parts reddish-white, with longitudinal brownish-black streaks, which are broader on the sides, some of the elongated feathers of which are of that colour, with lateral round spots of light red; the lower tail-coverts, however, are barred with greyish-black; the lower wing-coverts variegated with reddish-white and greyish-black. The females have the upper parts somewhat tinged with brown. Individuals vary in tint, and in the markings, especially of the tail, which are more or less extended across the webs.

Progress toward Maturity.—At the second moult, the birds assume the colouring described as peculiar to the adult, differing only in having the markings on the lower parts larger, and the upper parts less blue. The tint becomes purer and lighter as the birds advance in age.

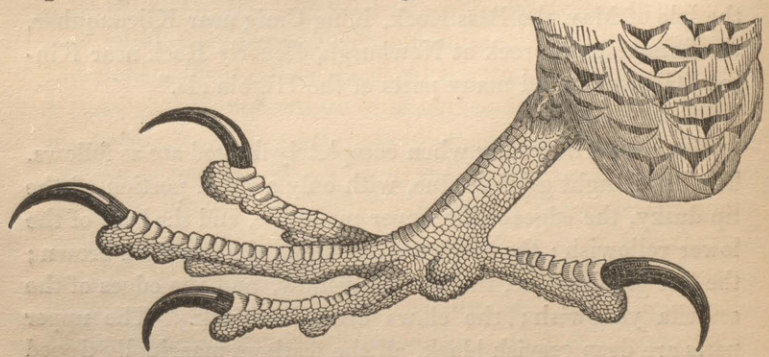


Fig. 225.

Linn.

3. FALCO SUBBUTEO. THE HOBBY FALCON.

Falco Subbuteo. Linn. Syst. Nat. I. 127.
Falco Subbuteo. Lath. Ind. Orn. I. 47.
Hobby. Mont. Orn. Dict.
Faucon Hobereau. Falco Subbuteo. Temm. Man. d'Orn. I. 25; II. 12.
Hobby. Falco Subbuteo. Selb. Illustr. I. 43.
Falco Subbuteo. Hobby. Jen. Brit. Vert. An. 82.

Wings when closed extending beyond the tail. Male with a black cheek-band, the upper parts greyish-black, the lower yellowish-white, with longitudinal brownish-black streaks, the lower tail-coverts and tibial feathers red. Female with the upper parts dark brown, the lower reddish-white, with broader dark brown markings, the lower tail-coverts and tibial feathers of a lighter red.

Male.—The Hobby bears a striking resemblance to the Peregrine Falcon, but is much inferior in size, and differs in having the wings longer, and the lower parts longitudinally streaked. The head is large, roundish, and flattened above; the neck short; the body ovate. The bill is short and strong; the upper mandible with its dorsal outline decurved from the base, its sides convex, the edges with a slight festoon, and a prominent angular process, the tip trigonal; the lower mandible with the angle short and wide, the dorsal line convex, the back broad and rounded, the edges inflected, with a semicircular notch on each side close to the directly truncate tip. Internally the upper mandible has a strong central ridge, the lower, which is deeply concave, an elevated central line. The tongue is fleshy, oblong, sagittate and papillate at the base, concave above, horny with a median groove beneath, its tip rounded and emarginate. The tarsi are feathered anteriorly for a third of their length, short, slender, compressed behind, covered before and on the sides with angular scales, of which five over the joint are scutelliform. The toes are slender, con-

nected at the base by short webs, the first strong, the fourth considerably longer than the second, the third much longer; the hind toe with eight scutella, the second with twelve, the third eighteen, the fourth fourteen.

On the upper parts the plumage is firm and rather compact, on the lower rather blended. The cere is for the most part bare; the loral space covered with diverging bristle-tipped plumelets. The feathers of the head are short and rounded, of the back oblong, as are those of the breast, of the sides of the body and outer part of the tibia elongated. The wings are very long, narrowed toward the end, and pointed; the second quill longest, but not much exceeding the first, which has the inner web abruptly cut out toward the end. The tail is rather long, slightly rounded; the feathers broad, rounded, but when new acuminate.

The bill is light blue at the base, bluish-black toward the end; the cere, eyelids, and feet yellow, the claws black. The general colour of the upper parts is greyish-black, the shafts of the feathers darker, and their margins of a paler tint; the hind part of the neck above the middle white; the quills black, with transverse yellowish-brown spots on the inner webs; the tail dark brownish-grey, the inner webs of all the feathers, excepting the two middle, with transverse reddish-white marks; the throat and sides of the neck are white; a mystachial black band proceeds from the angle of the mouth on each side; the breast and abdomen are yellowish-white, with longitudinal dark-brown streaks; the tibial feathers, and the lower tail-coverts bright orange-red.

Length to end of tail 12 inches, extent of wings 26; wing from flexure 10; tail $5\frac{1}{2}$; bill along the ridge $\frac{9}{12}$, along the edge of lower mandible $\frac{9}{12}$; tarsus $1\frac{5}{12}$; hind toe $\frac{6}{12}$, its claw $\frac{5\frac{1}{2}}{12}$; second toe $\frac{10}{12}$, its claw $\frac{6}{12}$; third toe $1\frac{4}{12}$, its claw $\frac{5\frac{1}{2}}{12}$; fourth toe $1\frac{1}{12}$, its claw $\frac{5}{12}$.

Female.—The female, which is considerably larger, resembles the male in colour, differing only in having the upper parts tinged with brown, the lower reddish-white, the tibial feathers and lower tail-coverts of a lighter red, and the tail obscurely

marked with darker bands. The other markings are nearly as in the male, but those on the lower parts are broader.

Length to end of tail 14 inches, extent of wings 28; wing from flexure $10\frac{3}{4}$; tail 6; bill along the ridge $\frac{6}{12}$; tarsus $1\frac{1}{2}$; middle toe and claw 2.

Habits.—Few instances of the occurrence of this bird in England have been recorded, and I have never seen an individual procured in Scotland. In the former country it is supposed to arrive in April, and depart toward the end of October, "about the time the Merlin arrives in the southern parts." It seems to prefer inland situations, and is said by Montagu to build in trees, sometimes taking possession of a crow's deserted nest. The eggs, three or four in number, are broadly elliptical, bluish-white, blotched with greenish-brown. Of two specimens from France examined by me, one measured an inch and eight twelfths, the other an inch and five twelfths in length, while the greatest breadth of both was an inch and two and a half twelfths. Its habits have not been well described by those who have had opportunities of observing them in Britain, but its flight is said to be extremely rapid, and its courage inferior to that of no other species, so that when hawking was in vogue, it was trained for the chase, although it does not appear to have been a favourite. Its food consists of small birds and insects. "We have frequently," says Montagu, "witnessed the flight of this species in pursuit of a Sky-lark, which appears to be its favourite game; and it is astonishing to observe how dexterously the little bird avoids the fatal stroke until it becomes fatigued. A Hobby in pursuit of a Lark was joined by a Hen-Harrier, who not being so rapid on wing, was usually behind, and ready to avail himself of the sudden turns the unfortunate Lark was compelled to make to avoid the talons of the Hobby; however, after numberless evolutions, the Hen-Harrier relinquished, being unequal to the chase, and left the deadly stroke to one better adapted for rapid and durable flight, and aërial evolutions. The country was open, and as far as the eye could discern the chase continued, but doubtless without a chance of the Lark's avoiding the fatal blow." The northern limits of the

range of this species in Britain, in so far as is known, are the Elgin Nairn counties of ~~Durham~~ and ~~Cumberland~~.[1] It is said to be generally distributed over the continent of Europe, extending in summer to Denmark, Sweden, and Norway, and specimens have been received from India.

Young.—When fully fledged the young have the upper parts brownish-black, but with the margins of all the feathers yellowish-white. The forehead and a line over the eyes are yellowish-grey. The quills have their inner webs marked as in the adult, and their tips reddish-white, as are those of the tail-feathers, which are marked with transverse bands of light red, disappearing at the inner third of the outer web, the two middle feathers plain. The throat is yellowish-white, and that colour extends in a band over the hind-neck; the mystachial bands are narrow; the breast and abdomen yellowish-white, with longitudinal dark brown streaks; the tibial feathers pale yellowish-red, streaked like the breast; the lower tail-coverts yellowish-white, with the shafts brown.

[1] Mr. St. John, residing at the time in Morayshire, says:—"The hobby, a beautiful little hawk, like a miniature peregrine falcon, is not very common here, though I have occasionally killed it. This kind of hawk leaves us before the winter. I have seen its nest in a fir or larch tree; but they seem to be very rare here."

4. FALCO VESPERTINUS. THE ~~ORANGE-LEGGED~~ Red-footed FALCON.

RED-LEGGED ~~OR RED-FOOTED~~ FALCON. ORANGE-LEGGED HOBBY.

Falco vespertinus. Linn. Syst. Nat. I. 129.
Falco vespertinus. Lath. Ind. Orn. I. 46.
Faucon à pieds rouges ou Kobez. Falco rufipes. Temm. Man. d'Orn. I. 33.
Orange-legged Hobby. Falco rufipes. Selb. Illustr. I. 45.
Falco rufipes. Red-legged Falcon. Jen. Brit. Vert. An. 83.

Wings when closed about the same length as the tail. Male with the plumage of a uniform deep greyish-blue, excepting that of the abdomen and legs, and the lower tail-coverts, which are bright yellowish-red; cere orange-red, feet reddish flesh-colour. Female with the upper part of the head and the hind-neck yellowish-red, the back greyish-blue, barred with black, the tail bluish-grey with black bands, the lower parts light yellowish-red, with oblong brown spots. Young with the head reddish-brown with black shaft-lines; the feathers of the back deep brown edged with light red, the space about the eyes blackish, the lower parts yellowish-white, with longitudinal brown spots.

Male.—The ~~Orange-legged~~ Red-footed Falcon is similar in form to the Hobby, but is easily distinguished in all stages by its colours, which differ from those of any other British species. The head is rather large and round; the bill very short and strong; the upper mandible with the dorsal line decurved from the base, the sides convex, the edges with a distinct festoon, and a narrow dentiform process, the tip trigonal and acute, the lower mandible with the angle short and very broad, the dorsal line convex, the back broad and rounded, the sides convex, the edges inflected, with a semicircular notch on each side close to the directly truncate tip. The tarsi are slender, feathered anteriorly for more than a third down, covered in the

rest of their extent with angular scales, of which four on the inner and fore part are larger, and three over the joint scutelliform. The toes are slender, the anterior connected by short basal webs, the hind toe short, with five scutella, the second shorter than the fourth, and with eight, the third with thirteen, the fourth with six scutella. The claws are slender, compressed, acuminate, curved in the fourth of a circle.

On the head and neck the plumage is blended, on the back rather compact, on the lower parts rather loose; the feathers in general ovate and rounded; the greater part of the cere is bare; the loral space covered with divergent bristle-tipped plumelets. The eyelids are bare, but furnished with ciliæ. The wings are long and pointed; the quills twenty-three, the second longest, the first five-twelfths shorter than the second, two-twelfths shorter than the third, and having the inner web abruptly cut out to the distance of an inch and a half from the end, the second with the inner web narrowed. The tail is long, somewhat rounded, the middle feathers being three-fourths of an inch longer than the lateral.

The bill is pale yellow at the base, yellowish-brown toward the end; the cere and eyelids orange; the feet light yellowish-red, the claws pale yellow, with their tips brown. The general colour of the plumage is deep greyish-blue; the quills lighter, with their shafts brownish-black; the tail blackish-blue; the abdominal, tibial, and subcaudal feathers, light yellowish-red.

Length to end of tail 12 inches, to end of wings $11\frac{3}{4}$; wing from flexure 9, tail $5\frac{1}{4}$; bill along the ridge $\frac{9}{12}$, along the edge of lower mandible $\frac{10}{12}$; tarsus $1\frac{4}{12}$; first toe $\frac{5}{12}$, its claw $\frac{5}{12}$; second toe $\frac{6\frac{1}{2}}{12}$, its claw $\frac{5\frac{1}{2}}{12}$; third toe $1\frac{1}{12}$, its claw $\frac{6}{12}$; fourth toe $\frac{8}{12}$, its claw $\frac{4}{12}$.

Female.—The adult female has the bare parts coloured as in the male. The upper part of the head and the hind-neck are light brownish-red; the back, wing-coverts, and secondary quills leaden grey, transversely barred with bluish-black; the tail light grey barred with black, there being ten bars on the lateral feathers, and the two middle feathers being more faintly marked; the primary quills greyish-black, but their inner

webs barred, with paler intervals. The cheeks and throat are white; the eyes encircled with black, of which there is also a short mystachial band; the breast and sides pale red, with reddish-brown longitudinal streaks; the tibial feathers plain reddish, the abdomen and lower tail-coverts lighter; the lower wing-coverts rufous, with dark-brown transverse bars; the lower surface of the primaries greyish-white, with transverse bars of black; that of the tail bluish-grey with bars of bluish-black, the last bar larger.

Length to end of tail 13 inches; wing from flexure $9\frac{1}{2}$; tail $5\frac{1}{2}$; bill $\frac{9\frac{1}{2}}{12}$; tarsus $1\frac{5}{12}$; middle toe $1\frac{1}{12}$, its claw $\frac{6}{12}$.

Habits.—It is to Mr Yarrell that we are indebted for the first notice of the occurrence of this beautiful falcon in Britain. In the fourth volume of Mr Loudon's Magazine of Natural History, he states that three individuals, an adult male, an adult female, and a young male, were obtained in May 1830, at Horning, in Norfolk, and that a female was shot in Holkham Park. Another individual, he informs us, was shot in the same county in 1832. Two specimens obtained in Yorkshire, one in the county of Durham, and two more, one of which was kept two years in the Menagerie of the Zoological Society, the other obtained in the neighbourhood of Devonport, complete the list of individuals procured in England. None have hitherto been found in Scotland, and only one is recorded as having been killed in Ireland. According to M. Temminck, it inhabits woods and thickets, and is common in Russia, Poland, Austria, Tyrol, Switzerland, and the districts on the northern side of the Appenines. It is said to feed on small birds and coleopterous insects, and to nestle in trees; but its habits have not been fully described.

Young.—When fledged, the young are described by Mr Yarrell as follows: "The top of the head reddish-brown with dusky streaks; the eyes encircled with black, with a small pointed moustache descending from the anterior part of the eye; ear-coverts white; upper surface of the body dark-brown; the feathers ending with reddish-brown; wing primaries dusky

black, the inner edges and tips buffy white; the tail-feathers dark-brown, with numerous transverse bars of reddish-brown; throat white; sides of the neck, the breast, and all the under surface of the body, pale reddish-white, with brown longitudinal streaks and patches on the breast; the thighs and their long feathers uniform pale ferruginous; beak, cere, irides, and other bare parts as in the adult female."

Remarks.—In form this species is very intimately allied to the Hobby, which it also resembles in the reddish colour of the tibial and subcaudal feathers. It is proportionally somewhat more slender, and has the claws smaller, while some slight differences in the scales of the tarsus are also observed. The bird to which the adult male approaches most nearly in colour is Harpagus diodon, in which the festoon of the bill is prolonged into a second toothlike process, and the wings shorter. In respect to colour, it is also nearly allied to Falco plumbeus. The specimens from which I have taken the descriptions of the adult male and female, are from the Continent.

Gmel.

5. FALCO ÆSALON. THE MERLIN FALCON.

STONE FALCON. ROCK HAWK. SPARROW HAWK.

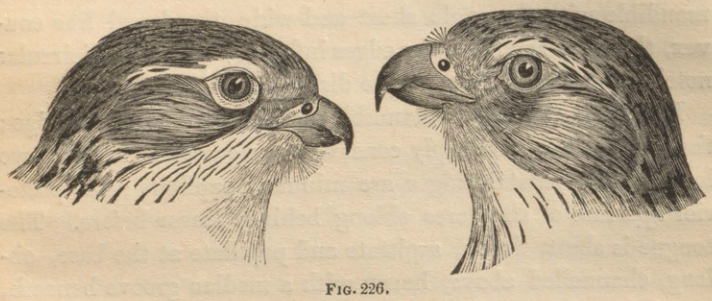


FIG. 226.

Falco Litho-falco. Lath. Ind. Orn. I. 47. Adult Male.
Falco Æsalon. Lath. Ind. Orn. I. 49. Female and Young.
Stone Falcon. Mont. Orn. Dict. Append. Adult Male.
Merlin. Mont. Orn. Dict. Adult Male and Female.
Faucon Emerillon. Falco Æsalon. Temm. Man. d'Orn. I. 27; II. 13.
Merlin. Falco Æsalon. Selb. Illustr. I. 51.
Falco Æsalon. Merlin. Jen. Brit. Vert. An. 83.

The wings when closed about an inch and a half shorter than the tail, the inner webs of the first and second quills abruptly cut out toward the end. Male with the upper parts deep greyish-blue, each feather with a black central line, the tail barred with black, the lower parts light reddish-yellow, with oblong blackish-brown spots. Female with the upper parts greyish-brown, the shaft-lines darker, the tail barred with pale reddish, the lower parts yellowish-white, with large longitudinal markings. Young with the upper parts brown, spotted with pale red, the lower reddish-white, marked as in the female.

MALE.—The Merlin, which is the smallest British species of its genus, is a very beautiful bird, of a form proportionally as com-

pact and muscular as the Peregrine, with the body rather short, ovate, and of somewhat greater depth than breadth anteriorly; the neck short; the head large, broadly ovate or roundish, and flattened above. The bill is very short and strong; the upper mandible with its dorsal outline decurved from the base, in nearly the fourth of a circle, its ridge obtuse, its sides convex, its edges sharp, with a slight festoon, and a distinct angular process, its tip sharp-edged, rather flattened, acute; the lower mandible with the angle short and wide, the dorsal line convex, the sides rounded, the edges inflected, with a semicircular notch on each side close to the directly truncate tip.

Internally the upper mandible has a strong central ridge; the lower, which is deeply concave, an elevated line. The two longitudinal palatal ridges are minutely papillate; the posterior aperture of the nares oblong behind, linear before. The tongue is short, fleshy, sagittate and papillate at the base, oblong, channelled above, horny with a median groove beneath, rounded and emarginate at the end. The œsophagus is four inches and a quarter in length, wide, dilated on the lower part of the neck into a crop an inch and a half in width, then contracted to ten-twelfths, but at the lower part enlarged. The walls are thin, the mucous coat disposed in longitudinal plaits, which are larger and more numerous in the crop, but disappear, as in the other birds of prey, when the organ is filled. The proventricular glands form a belt three quarters of an inch in length, which has six shallow longitudinal grooves. The stomach is roundish, somewhat compressed, an inch and a quarter in diameter when distended; its walls thin, the muscular coat being formed of a single series of fasciculi; the tendinous spaces five-twelfths in diameter. The pylorus has three small knobs or valvular prominences. The intestine measures thirty-one inches in length, and varies from three-twelfths to a twelfth and a half in width, until the rectum, which is wider, gradually dilates, and forms a globular cloaca, three-fourths of an inch in width. The cœca are extremely small, forming a shallow sac, not more than half a twelfth in depth.

The eyes are large, the eyelids furnished with short ciliary bristles, the superciliary ridge bare and prominent. The nos-

trils roundish, nearly a twelfth in diameter, with a central papilla. The aperture of the ear roundish, rather large, three-twelfths in length.

The tarsi, which are feathered anteriorly more than a third down, are short, slender, somewhat compressed, covered with angular scales, of which the anterior are much larger, and four over the joint are scutelliform. The toes are slender, scutellate above, prominently padded beneath, the anterior connected by short basal webs, the first short, with eight, the second considerably shorter than the outer, and with ten, the third long, with twenty-one, the fourth with eleven scutella. The claws are well curved, long, slender, narrowed beneath, and tapering to a fine point.

On the upper parts the plumage is compact, on the lower blended. On the head the feathers are short, ovato-lanceolate, and acuminate, on the other parts oblong, on the sides and outer part of the tibia elongated. The cere is bare above, the loral space covered with radiating bristle-tipped plumelets. The wings are long, rather broad, narrowed toward the end; the primaries strong, tapering, obtuse, the second longest, the first nine-twelfths, the second one-twelfth shorter; the first and second with the inner web abruptly cut out near the end, the third slightly sinuate; the secondary quills thirteen, broad, rounded, and somewhat incurvate. The tail is long, nearly even, but with the lateral feathers four-twelfths shorter than the next.

The bill is pale blue at the base, bluish-black toward the end; the cere and bare parts about the eye greenish-yellow; the irides dark-brown; the feet orange-yellow, the claws black. The inside of the mandibles is pale blue, the palate of a dark leaden blue, the tongue flesh-coloured, with its horny part blue. The general colour of the upper parts is a deep greyish-blue, each feather with a central black line. The anterior part of the forehead, the loral space, and the cheeks are greyish-white, with blackish lines; over the eye is a greyish-white line, margined beneath with black, of which there is also a semicircular line anterior to the eye. On the hind-neck is a broad half collar of pale red, with small lanceolate black spots. The edge of the wings is whitish; the alula and primary coverts

dark greyish-blue, the outer feather of each spotted with white. The primary quills are blackish-brown tinged with grey. The outer margin of the first spotted with white, several of the rest with faint bluish spots on the outer web, and all having the inner web barred with white ; the secondary quills of the same colour as the back, their inner webs barred with white. The tail is light bluish-grey, the outer with eight, the middle with six black bars, of which the last is very broad, the tips greyish-white with a central black line. The throat is white; the rest of the lower parts white tinged with yellowish-red, each feather with a linear brownish-black spot, the markings on the neck being linear, on the breast lanceolate, on the sides broader. The tibial feathers are light yellowish-red, and their dusky lines are small ; those of the abdomen are without markings, and the lines on the lower tail-coverts are very slender. The lower wing-coverts are variegated with reddish-brown and greyish-white, the latter in roundish spots ; the lower surface of the quills and tail-feathers beautifully barred with dark-grey and greyish-white.

Length to end of tail 11 inches; to end of wings $9\frac{1}{2}$; extent of wings 26 ; wing from flexure $8\frac{1}{2}$; tail $5\frac{1}{4}$; bill along the ridge $\frac{9}{12}$, along the edge of lower mandible $\frac{9}{12}$; tarsus $1\frac{6}{12}$; first toe $\frac{6}{12}$, its claw $\frac{7\frac{1}{2}}{12}$; second toe $\frac{8}{12}$, its claw $\frac{6\frac{1}{2}}{12}$; third toe $1\frac{2}{12}$, its claw $\frac{6}{12}$; fourth toe $\frac{11}{12}$, its claw $\frac{5}{12}$.

Female.—The female, which is much larger and more robust, differs considerably in colour. The third quill is one-twelfth of an inch shorter than the second, which exceeds the first by ten and a half twelfths. The tail is slightly rounded, the lateral feathers being nearly a quarter of an inch shorter than the middle. The bill and other bare parts are coloured as in the male. The general colour of the upper plumage is deep brown tinged with blue, each feather having a medial black line. Part of the hind-neck is yellowish-white, spotted with brown. Most of the feathers on the back are in some faint degree terminally margined with reddish ; the quills, larger coverts, and alula, have a regular series of transversely oblong light red spots on both webs, and are tipped with reddish-grey. The

primaries and tail are of a darker tint than the back; the latter with eight bands on the lateral, and six on the middle feathers, of pale reddish spots, and a terminal band of greyish-white. The markings on the face are as in the male, but larger; the throat is yellowish-white, bounded on each side by a brown mystachial band. The lower parts are pale reddish-yellow, with numerous brown spots larger than those of the male, but similarly proportioned, some of the posterior lateral feathers with two round white spots on each web. The lower wing-coverts are brownish-red, spotted with yellowish-white; and the lower surface of the quills and tail dark brownish-grey, barred with light red.

Length to end of tail 12½ inches, to end of wings 11; extent of wings 29; wing from flexure 9¼; tail 5¾; bill along the ridge $\frac{10\frac{1}{2}}{12}$, along the edge of lower mandible $\frac{1}{1}\frac{1}{2}$; tarsus $1\frac{7}{12}$; hind toe $\frac{7}{12}$, its claw $\frac{7\frac{1}{2}}{12}$; second toe $\frac{1}{1}\frac{0}{2}$, its claw $\frac{7\frac{1}{2}}{12}$; third toe $1\frac{3\frac{1}{2}}{12}$, its claw $\frac{8}{12}$; fourth toe $\frac{1}{1}\frac{1}{2}$, its claw $\frac{7}{12}$.

Variations.—Males vary a little in the colour of the upper parts, which in old individuals is of a fine leaden blue, in younger birds tinged with brown. The bands and spots on the quills and tail-feathers vary in form and extent; and I have seen individuals in which no markings remained on the tail excepting the last black band, and others in which they were obliterated on the middle feathers only. The red tinge on the lower parts is more or less intense. The females also vary, but only in slight degrees, the upper parts in old individuals being tinged with blue.

Habits.—This beautiful little Falcon is by no means uncommon in many parts of Scotland. In the Hebrides, Shetland Islands, and various districts of the northern, middle, and southern divisions of the mainland, it is now and then seen. Mr Selby states that he has frequently met with it in the north of England, and various authors have described it as occurring in the middle and southern districts in winter, but disappearing toward the end of spring. In Scotland, it certainly remains all the year round, for I have seen specimens

killed at all seasons. Among the Pentland Hills, and those of the Greywacke range extending from St Abb's Head westward, it is met with in summer dispersed in pairs at long intervals; but in ~~winter~~ autumn it forsakes the higher grounds and betakes itself to the plains.

The flight of this species more resembles, in some respects, that of the Sparrow Hawk than of the Peregrine Falcon. It sweeps along, at no great height, glides over the fields, shoots by the edge of the wood, examines the thorn fence, and sometimes alights on a tree or wall, as if to survey the ground. Although it may occasionally pounce on a partridge, it usually preys on smaller birds, such as larks, thrushes, chaffinches, sandpipers, snipes, and plovers. In September 1832, I shot at Musselburgh an individual which had just secured a sanderling after a long pursuit. In the island of Harris, many years ago, I had one which had come to the ground with a starling, and was caught by a herd boy. The crops and stomachs of all those which I have dissected contained exclusively small birds; but it is said to prey upon insects also, which is very probable, they being a favourite food of most small hawks.

The place which the Merlin chooses for its nest is some retired spot among the hills, generally in the midst of heath or on rocky ground. The nest is rudely constructed of some twigs and tufts of heath, and the eggs, three or four in number, greatly resemble those of the Kestrel, being broadly elliptical, about an inch and seven-twelfths in length, an inch and two-twelfths in breadth, light red, or reddish-white, confusedly dotted, frequently also spotted or blotched, with deep red. Should one approach the nest, especially when there are young in it, the Merlins fly around and over head with great anxiety, uttering shrill cries, but keeping at a safe distance.

I believe there are few additional facts to be gleaned in our best ornithological books, and my correspondents seem to have little knowledge of the Merlin, for the only one who has sent me some notes respecting it is Mr Hepburn, who says:—"It is a rare bird in East Lothian, where it is named the Rock Hawk, from the circumstance of its nest being placed on the ground amongst rocks in such situations as the south side of

Traprain Law and the craggy acclivities of the Garleton Hills. Like the Sparrow Hawk, it often watches its prey, previous to making the fatal swoop. One fine day in August 1833, as a companion and I were rambling about the environs of Haddington, he shot at some small birds in a hedge, when to our surprise and delight a Rock Hawk tumbled out of it. Being apparently but slightly wounded, he was caged with a Kestrel, but refused all sustenance, and soon died. I have sometimes seen a Merlin glide into one of the tallest trees around our dwelling, survey the bushes in the garden, dart on his prey, and carry it off. I suspect that the Merlins migrate from this neighbourhood in winter, but they are so rare that it is difficult to be assured of this."

The Merlin was formerly trained for the chase, and seems to have been a special favourite with the ladies; but it was not held in much estimation by the men, as it is hardly qualified to kill partridges. It is said to be generally dispersed over the European continent, but has not hitherto been found in America, the individuals alleged to have been met with there having turned out to be "Pigeon Hawks."

Young.—The young, when fledged, resemble the adult female, but have the upper parts spotted with red. A male in my collection, and which I obtained when newly killed, had the bare parts as in the adult, but the cere and supraocular ridge of a duller tint. The general colour of the upper parts is dark brown, but already tinged with grey, the feathers edged and barred with pale brownish-red, those on the back having each, one, two, four, or six concealed spots of that colour. The alula, primary coverts, and primary quills are blackish-brown, spotted on both webs with light red, the secondaries lighter; all the quills terminally margined with reddish-white. The tail is blackish-brown, barred, the middle feathers with five, the lateral with six bands of light red, and all of them tipped with reddish-white over the eyes and on the hind-neck, the bands are light reddish, spotted with dusky. The throat is yellowish-white; the cheeks yellowish-red, streaked with brown, the eye margined anteriorly with black. The lower parts are

pale reddish-yellow, with broad longitudinal streaks of dark umber brown; the lower tail-coverts and some of the abdominal feathers without markings, and those on the tibial feathers very slender. Some of the feathers on the sides have one or two pairs of round spots. The lower surface of the wings and tail transversely banded with dusky grey and pale reddish.

A female individual is similar, but has the upper parts rather lighter, the lower less tinged with red, and the markings there of a lighter brown; the number of light bands on the lateral tail-feathers, including the tip-band, nine; which I think is invariably the number in old and young.

Remarks.—The Merlin is so intimately allied to the Pigeon Hawk of America, Falco columbarius, that were individuals of both species presented for inspection, it would be very difficult to distinguish them. In all the specimens of the latter that I have examined, the light bands on the tail-feathers were fewer, being five on the middle, and eight on the lateral feathers. But I know very few instances of so perfect a mutual resemblance in two species; and it is therefore not altogether improbable that Falco columbarius may exist in Britain, as the only other two North American Falcons occur there.

In a work on the Rapacious Birds of this country which I published some years ago, I remarked that I had not met with individuals of different sexes that varied much in size; but having since then examined a great number of individuals, I am now of opinion that the male is generally much smaller than the female. The smallest male which I have seen measured eleven and a quarter inches in length, and the largest female thirteen and three quarters; but in actual bulk their difference was very great.

FALCO TINNUNCULUS. THE KESTREL.

KESTRIL, KASTRIL, KISTRIL. WINDHOVER. STONEGALL, STEINGALL, STANNEL. KEELIE. SPARROW HAWK. CLAMHAN RUADH.

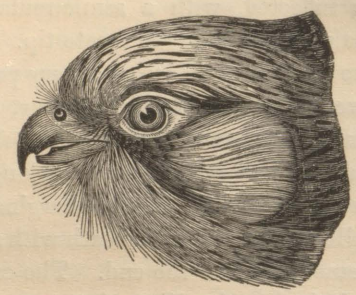


Fig. 227.

Falco Tinnunculus. Linn. Syst. Nat. I. 127.
Falco Tinnunculus. Lath. Ind. Orn. I. 41.
Kestrel. Mont. Orn. Dict.
Faucon Cresserelle. Falco Tinnunculus. Temm. Man. d'Orn. I. 29.
Kestrel. Falco Tinnunculus. Selb. Illustr. I. 47.
Falco Tinnunculus. Kestrel. Jen. Brit. Vert. An. 84.

The wings when closed about two inches shorter than the tail. Male with the head, hind-neck, rump, and tail light greyish-blue, the latter with a broad subterminal black bar; the back and wing-coverts pale-red, with oblong or triangular dark spots; the lower parts light yellowish-red, with longitudinal linear and guttiform spots. Female with all the upper parts light-red, with transverse spots and bars of dark-brown, the lower parts paler, with oblong dark markings. Young similar to the female, but with the spots larger.

Male.—The Kestrel, which is one of the most beautiful of our falcons, may be described as to form and proportions in

the same terms as the Merlin ; the body being moderately full, the neck very short, the head large, broad, and flattened above. The bill is short and strong ; the upper mandible with its dorsal line decurved from the base, in about the third of a circle, its sides convex, its edges sharp, with a moderate festoon, and a distinct angular process, the tip descending, trigonal, acute ; the lower mandible with the angle wide and short, the dorsal line convex, the back broad, the sides convex, the edges inflected, with a semicircular notch on each side close to the almost directly truncate tip.

Internally the upper mandible has a very prominent median ridge ; the lower, which is deeply concave, an elevated line. The two longitudinal palatal ridges are minutely papillate ; the posterior aperture of the nares narrow-oblong behind, linear before. The tongue is fleshy, short, emarginate and papillate behind, channelled above, horny beneath with a median groove, roundish and emarginate at the end. The œsophagus is four inches and a half in length, dilates into a crop an inch and a half in width, then contracts to half an inch, again dilates considerably in the proventricular part, which has a belt of glandules three quarters of an inch in breadth. The stomach is roundish, somewhat compressed, two inches in diameter ; its muscular coat thin, its tendinous spaces about half an inch in diameter. The pylorus has three valvular knobs. The intestine is two feet in length, four-twelfths in width in the duodenal portion, three-twelfths toward the cœca, which are three-twelfths in length, oblong or somewhat tapering ; the cloacal dilatation of the rectum globular, an inch and a quarter in width.

The eyes are large ; the supraocular ridge bare and prominent ; the eyelids with short ciliary bristles. The nostrils are round, nearly one-eighth in diameter. The aperture of the ear roundish, rather large. The tarsi are feathered anteriorly more than a third down, rather short, slender, covered with angular scales, of which the anterior are larger, especially a row of nine on the inner side, which are almost scutelliform, and four over the joint, which are true scutella. The toes are of moderate length, rather slender, scutellate above, tuber-

culate and papillate beneath, the third and fourth connected by a very short basal web; the first toe short, with seven scutella, the second of the same length as the fourth, with nine, the third with sixteen, the fourth with eleven scutella. The claws are moderately curved, long, rather slender, narrowed beneath, tapering to a fine point.

The cere is partially bare above, as is the lower eyelid: the feathers on the loral space and at the base of the bill, bristle-tipped. On the head, the feathers are short, ovato-oblong, and rather rounded; on the neck more elongated; on the back broadly oblong and obtuse; on the lower parts also all the feathers are oblong, on the sides of the body and outer part of the tibia elongated. The wings are long, of moderate breadth, narrowed toward the end; the primary quills of moderate strength, tapering, and obtuse; the second longest, the third about a twelfth shorter, the first more than three quarters of an inch shorter than the third; the first and second with the inner web abruptly cut out toward the end; the secondary quills thirteen, broad, and rounded. The tail is long, rounded, the lateral feathers an inch and a quarter shorter than the middle.

The bill is pale greyish-blue, toward the end bluish-black, at the base tinged with yellow; the cere and bare parts about the eye pale orange. The palate flesh-coloured, its sides pale blue. Irides hazel. Tarsi and toes orange; claws black; tinged with bluish-grey at the base. The feathers of the upper part of the head, and hind part and sides of the neck are light greyish-blue, each with a dusky shaft-line; the cheeks are of the same colour tinged with yellow; some of the frontal feathers are yellowish. The lower part of the hind-neck, the back, and the upper wing coverts are light red, each with the shaft dusky, and a triangular greyish-black spot near the end. The primary quills and their coverts are greyish-black tinged with brown, margined with paler, their inner webs with numerous white bars confluent on the margins, there being eight on the first quill; the outer secondary quills are similar, and the inner gradually become like the feathers of the back. The rump, upper tail-coverts, and tail, are light greyish-blue,

with dusky shaft lines; the tail with a subterminal black bar, an inch and a quarter in breadth, the tips greyish-white. The throat is yellowish-white. Anterior to the eye is a semicircle of black, continuous with a narrow, broken mystachial band of the same. The lower parts are pale yellowish-red, each feather with a narrow central line ending in a lanceolate or triangular spot of brownish-black; the feathers of the abdomen and the lower tail-coverts are paler and unspotted, those of the tibia of a clearer red, some of them with a dusky line.

Length to end of tail 13½ inches, to end of wings 11½; extent of wings 28; wing from flexure 9¾; tail 6½; bill along the ridge $\frac{9\frac{1}{2}}{12}$, along the edge of lower mandible $\frac{8}{12}$; tarsus 1½; first toe $\frac{6}{12}$, its claw $\frac{8}{12}$; second toe $\frac{8}{12}$, its claw $\frac{6}{12}$; third toe 1, its claw $\frac{7}{12}$; fourth toe $\frac{8}{12}$, its claw $\frac{5\frac{1}{2}}{12}$.

Female.—The female differs less in size than in any other British species of the genus; but is readily distinguished from the male by having all the upper parts light red, of a paler tint, and barred with dark brown, each feather of the back having four dark and three red bars, exclusive of the tip. On the scapulars the bars are more numerous; the secondary quills are similarly marked; but the primary quills are as in the male, only their light confluent spots being more or less tinged with red. The head and hind-neck are longitudinally streaked; the rump feathers are tinged with grey, as are those of the tail; on which are twelve dusky bars, of which the last is about three quarters of an inch in breadth, the tips being whitish. The lower parts are pale yellowish-red; the throat and abdomen without markings, the fore-neck longitudinally streaked with dark brown, the breast with guttiform spots, the feathers of the sides barred. The lower wing-coverts are whitish, with oblong dusky spots. The colours of the bill, eyelids, feet, and claws, as in the male.

Length to end of tail 14½ inches, to end of wings 12¼; extent of wings 30; wing from flexure 9¾; tail 7½; bill along the ridge $\frac{9}{12}$; tarsus $1\frac{7\frac{1}{2}}{12}$; first toe $\frac{1}{2}$, its claw $\frac{7}{12}$; second toe $\frac{9}{12}$, its claw $\frac{6}{12}$; third toe $1\frac{1}{12}$, its claw $\frac{8}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{5}{12}$.

Variations.—The males vary little in size. The grey of the head is sometimes tinged with brown; the red of the upper parts varies considerably in tint; the spots in size and form; and the tail may retain traces of its original ten bars, which on the middle feathers may be either direct or alternate, with the exception of the last, which is always continuous. The females assume more grey on the head, rump, and tail as they become older. The cœcal appendages of the intestine vary in size, from a quarter of an inch in length to half a twelfth; or they may be wanting on one or on both sides.

Change of Plumage.—When fresh, the colours of the plumage are much richer than toward the period of renewal, when they are sometimes much faded.

Habits.—The peculiar habits of this beautiful Falcon are well adapted for illustrating the range of vision of the diurnal rapacious birds. It has been alleged that Eagles, Kites, and Ospreys, not to mention other species of the same family, are capable of perceiving a very minute object at a most marvellous distance, even from a height at which they seem no larger than a midge or a mote. Experience, however, has led me to discredit such assertions, and to consider them as resulting rather from a vigorous imagination than from actual observation. There is no truth, not even probability, in the assertion that Eagles perceive living prey from a height exceeding a few hundred yards, although it is certain that they can distinguish the carcase of a sheep at a much greater distance. The Hen-harrier, the Sparrow Hawk, and the Kestrel, when searching for small birds, mice, and other objects, fly at a height of from ten to fifty feet. The latter never hovers at a greater distance from the ground than forty feet, and we know that its power of distinguishing its prey does not extend over a much greater range, for in traversing a meadow, it requires to assume numerous stations in succession. A Falcon, however, can perceive a Heron or other bird at a vast distance *in the air*, and I have seen domestic fowls aware of the presence of an Eagle two thousand feet above them.

The Kestrel, when searching for food, is easily distinguishable by its habit of hovering over the fields,—a habit which, although sometimes observed in other species, is in it so remarkable as to attract the notice of the least observant, and to have procured for it the name of Windhover. There it comes, advancing briskly against the breeze, at the height of about thirty feet, its wings in rapid motion, its head drawn close between its shoulders, its tail slightly spread in a horizontal direction, and its feet concealed among the plumage. Now it sails or glides a few yards, as if on motionless wings, curves upwards some feet, and stops short, supporting itself by rapid movements of its pinions, and expanding its tail. In a few seconds it flies forwards, flapping its wings, shoots off to a side, and sails, then rises a little, and fixes itself in the air. On such occasions it is searching the ground beneath for mice and small birds, feeding or reposing among the grass. Having discovered nothing, it proceeds a short way, and again hovers. In a few seconds it wheels round, flies right down the wind at a rapid rate, to the distance of some hundred yards, brings up, and hovers. Still nothing results, and again it glides away, bearing up at intervals, fixing itself for some seconds in the air, and then shooting along. When about to hover, it rises a few feet in a gentle curve, faces the wind, spreads its tail, moves its wings rapidly, and thus balancing itself, keenly surveys the ground beneath. The range of the tips of the wings at this time is apparently about six or eight inches, but sometimes for a few seconds these organs seem almost, if not entirely, motionless. The bird has once more suddenly drawn up, and is examining the grass with more determinate attention. It slowly descends, fixes itself for a moment, inclines a little to one side, hovers so long that you may advance much nearer, but at length closing its wings and tail, falls like a stone, suddenly expands its wings and tail just as it touches the ground, clutches its prey, and ascending obliquely flies off with a rapid and direct flight.

The food of this species consists chiefly of mice, Mus sylvaticus, Mus domesticus, Arvicola agrestis, and shrews, especially Sorex araneus. But it preys on many other animals, and in the numerous individuals which I have opened, I have found re-

This description is in no superior degree imaginative, for it was carefully taken from a Kestrel hovering the meadows to the west of Edinburgh, on a fine day in winter. But I have often observed Kestrels hovering at various heights, from twenty more than three hundred feet. It is very seldom, however, that when hovering with earnest intent, and not merely surveying the ground in a careless manner, they are beyond reach of ordinary small shot.

mains of young larks, thrushes, lapwings, and several small birds, both granivorous and slender-billed, together with the common dung-beetle, many other coleoptera, and the earthworm. It is also said to feed on lizards, and it has been known to carry off young chickens. Mice it sometimes swallows entire, more frequently breaks into two or three portions, but the birds, if fledged, it generally plucks. One is surprised on opening the stomach to find how large a mass it contains, rolled up into a ball, and, if digestion has far advanced, composed externally of hair and feathers, with the bones and teeth in the interior. This mass of refuse is ejected by the mouth in pellets, as is the practice with all the birds of this family. I have never happened to see it pursue a bird in open flight; but in such districts as the Outer Hebrides, where if field mice exist, they are extremely rare, it can have no other prey during the winter.

When advancing from one place to another, without searching for food, the Kestrel flies at a considerable height, with rapid flaps of its wings, and occasional sailings. In the neighbourhood of its haunts it may often be seen wheeling in irregular curves, nowhere more beautifully than when its breeding-station is on some maritime cliff. On such occasions, as well as when perched on a rock or tree, it frequently emits a loud shrill cry, somewhat similar to the syllables *plee*, *plee*, *plee*, or *klee*, *klee*, *klee*, or, as the country people in the south of Scotland interpret it, *keelie*, *keelie*, *keelie*. At the commencement of the breeding season it is remarkably vociferous; but when traversing the fields in search of plunder it is seldom heard to emit any cry. It resorts to rocks on the coast, or in the interior, to ruined castles or other buildings, sometimes to towers or steeples in the midst of towns, and frequently to trees in flat wooded districts. It often takes possession of the deserted nest of a crow or magpie, but in rocky tracts, and in the unwooded parts of the country, it breeds on cliffs or on craggy banks, usually scraping a slight cavity for its eggs. Those who maintain that the Kestrel always breeds in trees, may be informed that on the face of the Castle Rock of Edinburgh, facing Princes Street, there has been a Kestrel's nest for more

and on the rock of Dunottar, in Kincardineshire, from "time immemorial".

than twenty years. Indeed in Scotland, twenty nests might be pointed out in rocks, for one in a tree. The eggs, which vary from three to five, are of a broadly elliptical or roundish form, pale reddish-orange, or reddish-white, confusedly dotted or patched all over with dull brownish-red. They vary in length from an inch and a half to an inch and three-fourths, with an average breadth of an inch and a quarter.

This Falcon appears to be the most numerous of our rapacious birds, being generally distributed in England and Scotland, from Devonshire to Cape Rath and the Shetland Isles, and from the eastern to the western shores. It is difficult to say where it is most abundant, it being found equally in bare and in wooded tracts; but in rocky maritime pasture-lands, and in the grassy valleys of the interior, it is more frequently seen, while in the central heathy parts it is of very rare occurrence. It is less frequent in the north than in the south of Scotland, and it would probably be more numerous in England than in the latter district, were it not liable to be destroyed by game-keepers.

Mr Harley, who resides in Leicestershire, states that it abounds there. "The numbers," he continues, "are greatly diminished in the brumal months, and therefore we may conclude that a partial migration then takes place. It generally nestles in the spruce fir, selecting the deserted nest of a Carrion Crow or Magpie, in one of each of which I have found its eggs. Like the Cuckoo, it does not make a nest for itself. Atkinson, in his Compendium, says 'it breeds in hollow trees, and lays four or five pale reddish eggs;' but I have never met with it breeding in such places. I have known a bird of this species, which was kept two or three years as a garden pet, lay three eggs, and sit upon them with the same patience as if she had a partner. The eggs of course were unproductive. The kestrel when pinioned will climb up a cage side, or a small tree, holding fast by the bill, after the manner of a parrot. I saw one doing so at Bradford, in Yorkshire, in January 1839. Confinement and domestication bring out new habits in animals. Thus, my Goldfinch will climb all round a large breeding-cage,

just like a parrot, seizing fast hold by the bill, and moving the feet alternately. In this way he will clamber either up or down, horizontally or diagonally, all over the cage."

Kestrels taken from the nest are easily tamed, so as to become familiar, confiding, and in some degree obedient. The species was formerly trained to pursue small birds, such as quails, snipes, and larks, and was held in considerable estimation. Mr Thompson of Belfast states that "the kestrel has been so far trained by Mr William Sinclaire as, when given its liberty, to attend and soar above him like the peregrine falcon, and fly at small birds let off from the hand. One of these hawks, which was kept by this gentleman in the town of Belfast, had its freedom, and flew every evening to roost in an extensive plantation in the country, about a mile distant, in flying to and from which it was at first recognised by the sound of the bells attached to its legs. This bird returned regularly to its town domicile at an early hour in the morning."

Mr Waterton, who has given a pleasing account of this bird in his Essays on Natural History, finds it migratory in his neighbourhood, and is "of opinion that a very large proportion of those which are bred in England leave it in the autumn, to join the vast flights of hawks which are seen to pass periodically over the Mediterranean Sea, on their way to Africa. Last summer," he continues, "I visited twenty-four nests in my park, all with the windhover's eggs in them. The old birds and their young tarried here till the departure of the swallow, and then they disappeared. During the winter, there is scarcely a windhover to be found. Sometimes a pair or so makes its appearance, but does not remain long. When February has set in, more of the windhovers are seen; and about the middle of the month their numbers have much increased. They may be then heard at all hours of the day; and he who loves to study nature in the fields may observe them, now on soaring wing, high above in the blue expanse of heaven; now hovering near the earth, ready to pounce upon the luckless mouse; and now inspecting the deserted nests of crows and magpies, in order to secure a commodious retreat, wherein to perform their approaching incubation. Allowing, on an aver-

age, four young ones to the nest, there must have been bred here ninety-six windhover hawks last summer: add the parent birds, and we shall have, in all, one hundred and forty-four. Scarcely five of these birds were seen here from Michaelmas to the latter end of January."

I have not observed any deficiency of Kestrels in the districts bordering on the Frith of Forth in winter, when, on the contrary, I think they are more numerous there than in summer. Probably, like the Merlin, this species merely migrates from the interior to the coast. In the inland parts of East Lothian, Mr Hepburn also finds it more numerous in summer, as will be seen from the following notice with which he has favoured me.

"Though by no means an uncommon bird in this county, yet from the middle of October 1838 to March 1839, I did not see a single individual; but as spring advanced, their numbers increased. This season, I have seen none since the 15th of October. From this I think it is probable that they annually migrate from this district; but as I only began in May 1838 to pay particular attention to matters of this kind, I cannot speak decidedly on the subject. Delightful truly it is to seek the haunts of the Kestrel on some calm spring morning, when love has tuned every throat in song, and to observe what effect the season has upon its race. There they are, high up in the blue vault of heaven, soaring about, now descending to search the fields, and again mounting aloft. Hark how the woods and rocks resound to their joyous *kee*, *kee*, *keelie*, *keelie*. There is grace in every action, and to me music in each note. They commonly make use of the deserted nest of the Carrion Crow, laying from three to five eggs, about the end of March. The young are fledged in June. Many years ago I knew of a Kestrel's nest in a hole in a precipitous old-red-sandstone rock, on the banks of Whittingham water. A young man, who knows the species well, informs me that he has frequently known it to nestle in such situations. Two or three pairs breed annually among the rocks on the south side of Traprain Law, about one mile from this place.

"It is much to be regretted that the Kestrel should suffer for

the Sparrow Hawk, with which it is in this neighbourhood almost always confounded. I have often spoken to game-keepers in its behalf, but the mangled forms which I too often see nailed against the walls of the dog-kennel, shew that my friendly advice has been disregarded. With us its food consists chiefly of mice, and when in search of prey it glides softly through the air in large circular sweeps, at a moderate elevation, now poised on fluttering pinions, now resting in the air without motion, and now descending on the unconscious quarry. With all deference to the superior knowledge of that distinguished naturalist Mr Waterton, I shall humbly endeavour to account for its migration. After the fields are cleared of the grain, the Field-mouse begins to form a store, and nestling in a warm bed of leaves of trees, bushes, and the cultivated grasses, he probably feels little desire to bask in the sun, without a blade of any thing to screen him from his numerous foes. The ground, too, is very damp at this season, and, all things considered, it prefers moving during the darkness, so that the Barn Owl does not starve. I have dug the burrows of the mice in December, and have often found from a half to three quarters of a pint of grain in them. Consider how very few beetles are moving during this season, and it is not to be wondered at that the Kestrel leaves us. Birds constitute no part of its food. If you doubt this, go to the fields and observe for yourself. The Lark ceases not his song in its presence, and the Brown Linnet passes it unheeded, as with mellow note he bounds to his nest in the golden-blossomed furze. When he comes to the stack-yard, no anxious cluck is heard from the domestic hen to her young, the Chaffinch and Sparrow continue picking up the seeds at the barn door, and the Swallow, his rival in graceful flight, sings his song from the top of the chimney of the steam-engine. I however own that when a locality is much disturbed by the Sparrow Hawk, the Kestrel is liable to be mobbed.

" I have no means of ascertaining how many mice it requires per diem. Allow 4, which is surely a moderate estimate, and multiplying by 210, the number of days it remains with us, we find the result to be 840 mice. Supposing the sexes to be in equal proportion, there would be 420 pairs. Adult mice are

said to breed four times in the year. Allow that one half have 4 litters, one fourth 3 litters, and the remaining fourth two litters. Give 7 to each birth, which is about the average, and the amount will be 9555. Thus, a single Kestrel, during a residence of 210 days, is the means of destroying 9555 + 840 = 10,395 mice. If we were to calculate how many young the progeny of these 840 mice would produce, and so on, the numbers would exceed belief. It is quite certain, at all events, that the Kestrel, feeding for the most part on mice, must destroy vast quantities of them, and that he well deserves protection as the benefactor of man. I much fear, however, that all humane considerations will be little heeded so long as the present game-laws are in force."

In one particular Mr Hepburn is certainly mistaken; for, as I have stated, I have repeatedly found remains of birds in its stomach. Upon the whole, the habits of this species are pretty well known, and as I have nothing further of importance to say on this head, we may now inspect the young, which are at first covered with greyish-white down.

Young.—When fledged they nearly resemble the adult female. The bill is light greyish-blue, toward the end yellowish-grey; the irides dark brown; the cere and superciliary ridge pale greenish-blue, the feet yellow, the claws brownish-black with their tips paler. The head and hind-neck are light brownish-red, with longitudinal blackish-brown streaks; the upper parts of the body, the wing-coverts and tail, light red, the feathers transversely marked with broad dark brown bands, of which the last is somewhat triangular. The primary quills and their coverts are dark brown, the latter with light red spots on the inner, the former on both webs. There are eight dark bars on the tail, the last three-quarters of an inch in breadth, the tips dull reddish-white. The lower parts are pale yellowish-red, the sides of the neck and the breast with longitudinal dark brown streaks, the sides marked with streaks transversely barred. The feathers of the legs, abdomen, and subcaudal region light reddish-yellow, some of the former having a dusky shaft-line.

Progress toward Maturity.—At the first moult, the male assumes a greyish-blue colour on the head, rump, and tail; but the head is still tinged with red, and the tail barred on both webs. At the next moult, the tints are purer, the dark markings smaller, and the spots on the outer webs of the tail-feathers have disappeared. The dark markings of the female also become more attenuated; but the parts which ultimately become greyish-blue in the male, are in her merely tinged with that colour, and the tail continues barred.

Remarks.—The comparative shortness of the middle toe, the enlarged anterior scales of the tarsus, and the rounded tail, of this bird, have induced some ornithologists to separate it from the genus Falco; but if differences so slight suffice to form generic characters, hardly two species can be kept together. Falco tinnunculoides of the south of Europe, and Falco sparverius of America, are the species most nearly allied to the Kestrel, which in form differs little from the Merlin. The young of that species bear a considerable resemblance in colour to the young and female of the Kestrel, the latter of which was figured by Buffon as a Merlin.

I omitted to mention in the proper place that, as the Rev. Mr Gordon, of Birnie, informs me, "the Kestrel, which is the most abundant of the small hawks in Morayshire, builds at the Rocks of Covesea, on the cliffs above Mill of Birnie, and in ravines about the Glen of Rothes, as well as in many similar situations."

Genus IX. Astur. Goshawk.

~~ACCIPITER. HAWK.~~

There is a series of falconine birds,

~~The genus Accipiter is composed of birds~~, generally of moderate size, which collectively occupy a station intermediate between the Falcons, Buzzards, and Harriers. Some of the larger species approach in form to those of the genus Buteo, and being proportionally more robust, with shorter and stronger tarsi, and a less elongated tail, have by some been formed into a separate genus, to which the name of Astur is given; while the smaller and more slender species are taken to constitute the genus Accipiter or Nisus. ~~It does not however appear to me that~~ the differences as to form and proportions between the largest and the smallest of these species are sufficient to constitute generic characters. The body in ~~all is light, rather~~ *the larger species is* broad anteriorly, ~~very~~ narrow behind; the neck short or of moderate length; the head rather large, roundish or broadly ovate, and flattened above.

Bill short, stout, compressed toward the end; upper mandible with its dorsal line ~~decurved from the base, nearly in the~~ *nearly straight and declinate to the* ~~fourth of a circle~~, the ridge convex, the sides sloping and somewhat convex, the edges sharp and overlapping, with a prominent broad lobe beyond the middle, the tip trigonal, a little concave beneath, and deflected; lower mandible with the angle wide and rounded, the dorsal line convex, the ridge broad, the sides rounded toward the end, the edges inflected, the tip obliquely truncate and rounded.

Mouth rather wide; palate flat, with two prominent longitudinal lines; upper mandible slightly concave, lower deeply channelled; tongue short, fleshy, concave above, rounded and slightly emarginate. Œsophagus wide, about the middle dilated into a large crop; proventricular glands small, oblong, forming a complete belt. Stomach roundish or oblong, a little compressed, its muscular coat very thin and composed of a single series of fasciculi, its inner coat smooth and soft; intes-

are, perhaps not; but as the series is extensive, and the robust form of the eagles contrasts strongly with the extreme slenderness of some of the others, a generic separation may be allowed even by the most fastidious.

Astur. Goshawk.

tine rather short and of moderate width; cœca very small; rectum with a globular dilatation.

Nostrils ovato-oblong, lateral. Eyes rather large; eyelids ciliated; the lachrymal ridge prominent. Aperture of the ear roundish, rather large. ~~Legs of moderate length, slender;~~ strength T tarsus ~~rather long or~~ of moderate length, ~~generally slender,~~ rather stout, anteriorly scutellate, laterally scaly, posteriorly with large scales or scutella; toes slender, covered above with numerous short scutella, beneath tuberculate, there being a ~~long~~ fleshy knob on the last joint of each, and one at the next joint of the outer two; the third and fourth toes connected by a basal web, the first and second nearly equal, the third much longer. Claws long, well-curved, tapering, compressed, convex above, slightly concave beneath, acuminate.

Plumage compact above, blended beneath. Cere with bristle-tipped plumelets at the sides; space between the bill and eye covered with radiating slender feathers of the same nature. Feathers of the head rather short, of the neck moderate, of the sides and outer part of the tibia elongated, all more or less oblong and rounded. Wings long, much rounded, with twenty-three quills; primaries moderately strong, the first short, the fourth and fifth longest, the outer five with the inner web somewhat abruptly cut out. Tail ~~very~~ long, straight, even or slightly rounded, of twelve ~~rather~~ broad rounded feathers.

The species of this genus are distinguished by their elegant, ~~generally slender~~ form, the prominent festoon of the upper mandible, their comparatively short rounded wings, lengthened tail, and ~~slender~~ tarsi and toes, of which the third ~~is very~~ proportionally long ~~in the smaller species~~. They fly low when searching for food, advancing with a rapid gliding and stealthy flight, dart upon their prey on the ground, or in the air, or perched on trees or bushes, between the branches of which they glide on occasion even at full speed. They nestle in trees, or on rocks, forming a rude nest of twigs and some soft materials, or appropriate the nest of a Crow or other bird, and lay from three to five large, broadly elliptical, spotted eggs. Species occur in all parts of the globe. ~~Two are met with in Britain, one very common, the other extremely rare.~~ One only is very rarely met with in Britain.

1. ~~ACCIPITER~~ PALUMBARIUS. THE GOSHAWK.

Falco Palumbarius. Linn. Syst. Nat. I. 130.
Falco Palumbarius. Lath. Ind. Orn. I. 29. Adult.
Falco gentilis. Lath. Ind. Orn. I. 29. Young.
Goshawk. Mont. Orn. Dict.
L'Autour. Falco Palumbarius. Temm. Man. d'Orn. I. 55 ; III. 27.
Goshawk. Astur Palumbarius. Selb. Illustr. I. 29.
Accipiter palumbarius. Goshawk. Jen. Brit. Vert. An. 85.

Male about twenty inches long, with the upper parts dark bluish-grey, the crown of the head and a broad band on its sides black, the lower white, transversely barred with blackish-grey, and marked with longitudinal shaft-lines. Female about twenty-five inches long, with the colouring similar, but the upper parts greyish-brown. Young brown above, the feathers edged with reddish-white, the head brown, the nape yellowish-white, streaked with dark brown, the lower parts yellowish-white, with longitudinal oblong dusky spots.

Male.—The Goshawk, which has become so exceedingly rare in Britain, that I have never been able to obtain a recent specimen, and have not seen more than half a dozen in museums, is among the most beautiful of our rapacious birds, being in form intermediate between the Sparrow Hawk and the Brown Buzzard, but in most respects much more nearly allied to the former than to the latter. Its body is moderately full, its neck rather short, its head of moderate size, roundish, and flattened above. The bill short, strong, with the dorsal line of the upper mandible nearly straight and slightly declinate to the edge of the cere, then decurved in about the fourth of a circle, its sides slightly convex, the edges with a rather prominent broad lobe, behind which is a slight festoon, the tip trigonal and acute; the lower mandible with the angle wide, the dorsal

line convex, the sides rounded, the edges arched, the tip obliquely truncate.

The palate is flat, with two soft longitudinal ridges, the upper mandible slightly concave, the lower deeply concave, both with a slightly prominent median line. The tongue fleshy, sagittate and papillate at the base, channelled above, with the tip rounded and emarginate, its lower surface horny, with a shallow median groove. The eyes large; the eyelids bare, but ciliated; the supraocular ridge distinct. Nostrils oblique, oblong, broader behind. Aperture of ear roundish, and rather large. Feet of moderate length; tarsi anteriorly feathered for nearly half their length, rather short, strong, anteriorly covered with fourteen short but broad scutella, laterally with angular scales, behind with numerous scutella. The toes strong, of moderate length, the first and second stoutest, and nearly equal in length, the third much longer, and connected by a basal web with the fourth, which is longer than the second; on the first are six, on the second four, on the third eighteen, on the fourth ten scutella. Claws strong, well arched, considerably compressed, acuminate.

The plumage is full, compact above, blended beneath; the cere laterally covered with bristle-tipped plumelets, as is the loral space; the feathers of the upper parts oblong and rounded, of the head short, of the lower parts narrower, those of the outer part of the tibia elongated. The wings are of moderate length, broad, and rounded; the primaries strong, tapering to a rounded point; the outer five with the inner web, and the second, third, fourth, fifth, and sixth with the outer web, narrowed toward the end; the secondaries, thirteen in number, broad, and abruptly rounded. The tail is long, broad, rounded, of twelve rounded feathers, of which the outer is an inch shorter than the middle.

The bill is light blue at the base, bluish-black at the end; the cere greenish-yellow; the iris reddish-orange, the supraocular ridge yellowish-green; the feet yellow, the claws black. The general colour of the upper parts is deep bluish-grey; the upper and hind parts of the head, and a broad band from the cheeks to the nape, black; over the eye a white band streaked

with brownish-black; the feathers of the nape white, with only the tips black. The alula, primary coverts, and primary quills are hair-brown, with the shafts lighter along the middle; the primaries barred with dark brown, the intervals between the bars being on the inner webs whitish, and variegated with grey; the secondaries greyish-blue externally, their inner webs with broad alternate bands of whitish variegated with grey. The tail brownish-grey, the middle feathers with four, the lateral with seven broad bands of brownish-black, the terminal band much larger, the tips white. The lower parts are greyish-white; the fore-neck and breast with longitudinal dusky lines, the breast with transverse undulated bars of blackish-grey, of which there are four on the anterior feathers; the tibial feathers beautifully barred with a lighter tint; the lower tail-coverts white, the lower wing-coverts white, barred with deep grey.

Length to end of tail 20 inches, to end of wings $16\frac{1}{2}$; extent of wings 43; wing from flexure 13; tail $11\frac{1}{2}$; bill along the ridge $1\frac{1}{2}$; along the edge of lower mandible $1\frac{2}{12}$; tarsus 3; first toe $1\frac{2}{12}$; its claw $1\frac{9}{12}$; second toe $1\frac{2}{12}$, its claw $1\frac{6}{12}$; third toe $1\frac{10}{12}$, its claw 1; fourth toe $1\frac{4}{12}$, its claw $\frac{10}{12}$.

Female.—The female resembles the male in colour, but has the upper parts tinged with brown.

Length to end of tail 26 inches, to end of wings $23\frac{1}{2}$; extent of wings 45; wing from flexure $13\frac{1}{2}$; tail 12; bill along the ridge $1\frac{7}{12}$; tarsus $3\frac{1}{4}$; hind toe $1\frac{2}{12}$, its claw $1\frac{3}{4}$; middle toe $2\frac{2}{12}$, its claw 1.

Habits.—Of this beautiful species, considered with reference to Britain, nothing is known beyond the fact of its having rarely been met with in Scotland, and still more rarely in England. It is said by several persons to be not very uncommon in Shetland and Orkney; but until specimens obtained there are produced, I must take leave to suppose that the natives of these islands have mistaken the Peregrine Falcon for the Goshawk. In many districts the latter name is that usually given to the Peregrine, and it does not appear that the

true Goshawk has been obtained in any part of Scotland for several years, insomuch that ~~we might~~ very reasonably apprehend the total failure of the native breed in that country. Mr Fenton informs me that he saw one which was shot in Forfarshire about fifteen years ~~ago~~, and in the museum of the University of Edinburgh is a young bird said by the late Mr Wilson to have been shot in Scotland. I have nothing to add to its history since in 1836 I penned the following remarks in my descriptions of the Rapacious Birds of Great Britain :—" In the more inland parts of the middle division of Scotland, especially among the Grampians of Aberdeenshire, it may now and then be observed ; but the few opportunities of studying its manners which have occurred to me were so fleeting, that I can add nothing to its history in this respect. When you are least expecting its appearance, it sweeps rapidly past you, or is seen swiftly winging its way over the fields or woods with a bird in its talons. In so far as I am acquainted with it, it resembles the Sparrow Hawk in its manners." According to M. Temminck, it is essentially a northern bird, which migrates southward in winter, few remaining to breed in the central parts of Europe. It was much esteemed when falconry was in vogue, and was flown at Pheasants, Partridges, Grouse, Ducks and Herons, as well as hares, which it pursued in direct flight, without rising above them like the Peregrine Falcon, from which it further differed in pursuing its quarry into woods and thickets. Its flight, which is rapid and gliding, is performed at a small height ; its activity almost equals that of the Sparrow Hawk ; and its disposition is sanguinary, suspicious, and unsocial, insomuch that it has often been known to kill its companions in captivity. Authors differ respecting the nest and eggs, and a good history of this bird is a desideratum, which cannot be accomplished by British observers, at least in their own country. Were it not doubtful whether the Goshawk of North America be really of the same species, I might refer to Mr Audubon's account of its habits. A specimen of that bird in my collection, and three others which I have seen, differ in some respects from ours, more especially in having the transverse markings on the lower parts more numerous and more

previous to 1846, when I saw in Aberdeen two very beautiful adult specimens, which had been preserved by Mr Mitchell, who, however, could only inform me that they came from the north of Scotland.

To this, however, I must add, that I have no real acquaintance with it, but only a dreamy recollection of a large hawk swiftly gliding along, as described above — and neither a Peregrine nor a Buzzard.

undulated, and the head and cheek-bands deep black. Mr Audubon, however, states that the American Goshawk exhibits numerous variations of plumage, some having transverse bars of large size on the breast, and even if it should be distinct from the European bird, its habits are probably very similar. They are thus described by him :—

" The flight of the Goshawk is extremely rapid and protracted. He sweeps along the margins of the fields, through the woods, and by the edges of ponds and rivers, with such speed as to enable him to seize his prey by merely deviating a few yards from his course, assisting himself on such occasions by his long tail, which, like a rudder, he throws to the right or left, upwards or downwards, to check his progress, or enable him suddenly to alter his course. At times he passes like a meteor through the underwood, where he secures squirrels and hares with ease. Should a flock of wild pigeons pass him when on these predatory excursions, he immediately gives chase, soon overtakes them, and forcing his way into the very centre of the flock, scatters them in confusion, when you may see him emerging with a bird in his talons, and diving towards the depths of the forest to feed upon his victim. When travelling, he flies high, with a constant beat of the wings, seldom moving in large circles like other hawks, and when he does this, it is only a few times in a hurried manner, after which he continues his journey." He further describes it as restless, seldom alighting unless to devour its prey, which consists of small quadrupeds, grouse, ducks, pigeons, snipes, and other birds. Its nest, which is placed on the branches of a tree, near the trunk, is large, and constructed of twigs and coarse grass, with a lining of fibrous materials. The eggs dull bluish-white, or greenish-white, sometimes spotted with brown, but often without markings. Those of the European Goshawk, according to M. Temminck, are greenish-grey, without spots.

Young.—When fledged the young differ much in colour from their parents. The bill is dark brown, paler toward the base ; the cere and legs greenish yellow, the claws brownish-black. On the upper part of the head the feathers are dark

brown, with light yellowish-red margins; on the hind-neck yellowish-white, each with a terminal streak of dark brown. The general colour of the upper parts is hair-brown or greyish-brown, the feathers edged with yellowish-red; the scapulars with three broad conceded whitish bands. The quills are brown, broadly barred with darker, and tipped with whitish. The tail is alternately banded with dark brown and light greyish-brown, and largely tipped with white, there being five dark bands on the middle feathers. The lower parts are light yellowish-red, or reddish-white; the throat, legs, and lower tail-coverts with longitudinal blackish-brown lines, the anterior part of the breast with oblong, and the rest with lanceolate spots of the same colour.

Remarks.—In a list of the birds of Shetland, with which I have been favoured by Dr Laurence Edmondston, that gentleman, whom a long residence and continued observation have rendered familiar with the productions of those islands, has the following note:—"Falco Palumbarius is not uncommon at all seasons. I have not myself seen its nest, but it is said to build in rocky cliffs. It preys chiefly on rabbits and pigeons." A Shetland specimen of this very rare bird would be a great acquisition to the London or Edinburgh Museums.

Genus X. Accipiter. Ray. Sparrowhawk.

1. ACCIPITER NISUS. THE Common SPARROW HAWK.

SPEIRSHEOG.

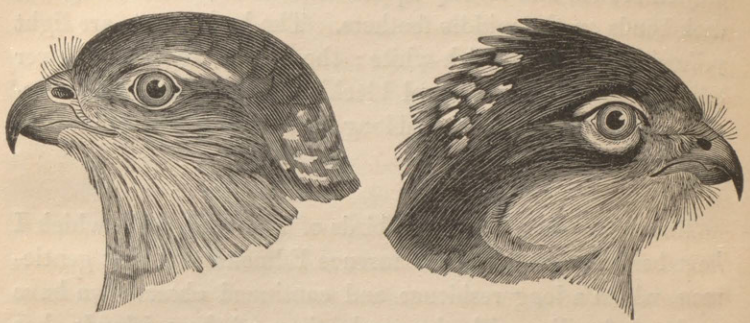


Fig. 228.

Falco Nisus. Linn. Syst. Nat. I. 131.
Falco Nisus. Lath. Ind. Orn. I. 44.
Sparrow Hawk. Mont. Orn. Dict.
L'Epervier. Falco Nisus. Temm. Man. d'Orn. I. 56; III. 28.
Sparrow Hawk. Accipiter fringillarius. Selb. Illustr. I. 32.
Accipiter fringillarius. Sparrow Hawk. Jen. Brit. Vert. An. 85.

Male about twelve inches long, with the upper parts dark bluish-grey, the lower reddish-white, transversely barred with yellowish-red. Female about fifteen inches long, with the upper parts greyish-brown, the lower greyish-white, transversely barred with dark grey. Young brown above, the feathers margined with light red, the markings on the lower parts more dusky, and the last band on each feather somewhat cordate or pointed, the female more tinged with red. In all stages, six dusky bands on the lateral, and four on the middle tail-feathers.

The "Sparrow Hawk," although bearing a general resemblance to the Goshawk, is of a much more slender form, insomuch that many ornithologists, for this reason alone, have re-

ferred it to a separate genus. The principal character on which this distinction is founded exists in the comparatively slim and elongated tarsi and toes; but as gradations occur between the sharp-shinned Hawk of America, which has the tarsi still more slender, and the Goshawk, I cannot see the propriety of forming the group into two genera. A greater difference as to size is seen between the male and the female in this than in any other British bird of prey, and even between individuals of the same sex the differences are such that many persons have supposed the Sparrow Hawk divisible into several species.

Male.—This remarkably elegant bird has the body slender, the neck short, the head of moderate size, broadly ovate, and rather convex above. The bill is very short, moderately stout, compressed; the upper mandible with its dorsal line decurved from the base, nearly in the fourth of a circle, the sides rapidly sloping and nearly flat, the edges anteriorly sharp, with a broad rounded dentiform process or festoon about the middle, the tip trigonal and very acute; the cere short, and in the greater part of its extent bare; the lower mandible with the angle short, broad, and rounded, the dorsal line convex, the back broad at the base, the sides rounded, the edges sharp and inflected, the tip obliquely truncate, with a shallow sinus, thin-edged, and rounded.

Internally the upper mandible is slightly concave, the lower deeply concave, with a prominent median line. The palate is flat, with two soft longitudinal, slightly papillate ridges. The posterior aperture of the nares is oblong behind, linear before. The tongue is half an inch long, sagittate and serrulate at the base, oblong, fleshy, broadly channelled above, with the tip rounded and emarginate. The œsophagus is four inches and a half long, at the upper part half an inch wide, then dilated into a crop an inch in width, after which it contracts to five twelfths. The proventricular portion is eight twelfths long; its glandules cylindrical, forming a continuous belt having four slight longitudinal depressions. The stomach is of a roundish form, somewhat compressed, an inch and a half in diameter; its muscular coat very thin, the fibres arranged in fasciculi, the tendons

about three twelfths in diameter, the inner surface smooth. The pylorus is very narrow, and has three valvular protuberances. The intestine is two feet six inches long, three-twelfths in width in the duodenal portion, its smallest diameter two twelfths; the cœca very small, being only two twelfths in length, three and a half inches distant from the extremity. The rectum, at first three twelfths in width, dilates toward the end so as to have a diameter of one inch.

The eyes are large, the eyelids margined with ciliary bristles, the lachrymal ridge prominent. The nostrils are rather large, oblique, oblong, broader behind. The aperture of the ear roundish, and rather large. The tarsi, which are feathered anteriorly for nearly a third of their length, are rather long, very slender, compressed, narrower before than behind, with an anterior elongated plate, obscurely marked with eighteen scutella, the sides with hexagonal scales, as is the hind part, on which they are much larger. The toes are very slender; the first short, the second stouter and somewhat longer, the third very long, and connected by a basal web with the fourth, which is longer than the second. On the first toe are nine scutella, on the second fourteen, on the third twenty-eight, on the fourth eighteen and several basal scales. The claws are well curved, compressed, laterally grooved, finely acuminate, the first and second largest and about equal.

The plumage is moderately full, soft, on the upper parts rather compact, on the lower blended. The loral space is covered with bristle-pointed feathers curving upwards. The wings are rather long, broad, much rounded; the fourth and fifth quills are longest and about equal, the first three inches, the second an inch and a quarter, the third four twelfths shorter. The outer five are slightly attenuated on the outer, deeply on the inner web. The secondary quills, thirteen in number, are broad and rounded. The tail is long, straight, even at the end, of twelve rather broad, rounded feathers.

The bill is light blue at the base, bluish-black at the end; the cere and eyelids greenish-yellow; the iris orange; the tarsi and toes yellow, the claws like the bill. The palate livid-blue. The general colour of the plumage on the upper

parts is slate-blue, or deep greyish-blue, with darker shaft-lines. The feathers on the nape are white at the base, and on each of the scapulars are two broad bands of the same colour. The outer primaries are dusky greyish-brown, and all the quills have the inner web marked with dusky bands, between which the inner margins are greyish-white. The tail is deep grey, with six broad bands of blackish-brown on the lateral and four on the middle tail-feathers, the last band broader and more distinct, and the tips greyish-white. The upper part of the cheeks is bluish-grey, the rest and the sides of the neck yellowish-red, the throat reddish-white. The fore part of the neck, the breast, sides, abdomen, and tibiæ, are transversely barred with reddish-white and yellowish-red, the latter colour prevailing on the breast and sides; each feather having five bands of white, and an equal number of pale red and dusky. The coloured bands become fainter on the hind parts, and gradually disappear on the abdomen, some of the feathers of which, as well as the lower tail-coverts, are white. The tarsal feathers are light red. The lower wing-coverts reddish-white barred with dusky. The dark bars of the wings and tail are more conspicuous on their lower surface.

Length to end of tail 13 inches, to end of wings 11; extent of wings 23; wing from flexure 8; tail $6\frac{1}{4}$; bill along the ridge $\frac{9}{12}$, along the edge of lower mandible $\frac{9}{12}$; tarsus $2\frac{1}{4}$; first toe $\frac{7}{12}$, its claw $\frac{9\frac{1}{2}}{12}$; second toe $\frac{8}{12}$, its claw $\frac{8}{12}$; third toe $1\frac{4}{12}$, its claw $\frac{6\frac{1}{2}}{12}$; fourth toe $\frac{11}{12}$, its claw $\frac{5}{12}$.

Female.—The female, which is much larger than the male, and proportionally somewhat more robust, differs considerably in colour. The bill and tarsi are much stouter, insomuch that the latter are not very different in strength from those of some species of the ~~division to which the name of~~ genus Astur ~~is applied~~. In an individual shot on the 2d October 1839, the œsophagus was four inches and three quarters in length, the crop an inch and a half in width, the contracted intrathoracic part seven-twelfths wide. The stomach a little compressed, round, an inch and a quarter in diameter. The proventricular belt complete, an inch and three-twelfths in breadth, without grooves.

The intestine two feet three inches in length, its widest part two and a half twelfths, the narrowest, toward the rectum, a twelfth and a quarter. The cœca are two slight knobs, one-twelfth in length and diameter. The rectum three inches long, its cloacal portion an inch in width. The gall-bladder oblong, half an inch in length; the entrances of the cystic and hepatic ducts four-twelfths apart. This individual not having been described, I now take another shot on the 18th May 1834.

The form of the parts is as described in the male. On the tarsus are eighteen indistinct anterior scutella, on the first toe six, on the second eight, on the third twenty-seven, on the fourth fourteen and several basal series. The fourth quill is longest, the fifth little shorter; the tail a little rounded, the lateral feathers being half an inch shorter than the longest. The bill and claws are light blue at the base, black toward the end; the cere and supraocular edge light greenish-yellow; the iris orange; the feet yellow-orange. The general colour of the upper parts is brownish-grey; the feathers of the hind-neck white at the base, the scapulars and inner secondary coverts with two large concealed bands of the same colour. On the tail are four dusky bars, and an obscure basal bar, the tip greyish-white. The quills are obscurely barred with dusky, and have their inner webs in the intervals yellowish-white, unless toward the end. The general colour of the lower parts is greyish-white, transversely marked with narrow bars of dusky-grey and brownish-red, each feather on the breast having five bars, the throat with longitudinal lines of deep brown. The abdomen is less barred, and the lower tail-coverts are white; the lower wing-coverts reddish-white, barred with dusky; the lower surface of the quills and tail-feathers pale grey, tinged with red, and barred with dark brown.

Length to end of tail $15\frac{1}{2}$ inches; extent of wings $28\frac{1}{2}$; bill along the ridge $\frac{1}{12}$, along the edge of lower mandible $\frac{10\frac{1}{2}}{12}$; wing from flexure $9\frac{2}{12}$; tail $7\frac{2}{12}$; tarsus $2\frac{5}{12}$; first toe $\frac{7\frac{1}{2}}{12}$, its claw $\frac{10\frac{1}{2}}{12}$; second toe $\frac{8\frac{1}{2}}{12}$, its claw $\frac{11}{12}$; third toe $1\frac{8}{12}$, its claw $\frac{7}{12}$; fourth toe 1, its claw $\frac{6}{12}$.

Variations.—Males vary in length from twelve to thirteen and a half inches, and proportionally in bulk. In adults the colour of the upper parts scarcely varies, but on the lower the red bars vary in breadth and purity. The largest females are seventeen inches long, the smallest fourteen. Very old individuals are sometimes nearly as blue on the back as the males, but generally greyish-brown, or hair-brown tinged with bluish-grey, is the prevailing tint. The length of the alimentary canal varies considerably. The iris varies in the males from yellow to orange and even yellowish-red.

	M.	M.	M.	F.	F.	F.
Œsophagus in length....	$4\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	5	$4\frac{3}{4}$	$4\frac{3}{4}$
Crop in width.....	1	1	1	$1\frac{1}{12}$	$1\frac{1}{2}$	$1\frac{1}{4}$
Stomach in diameter....	$1\frac{5}{12}$	1	$1\frac{1}{2}$	$1\frac{5}{12}$	$1\frac{1}{4}$	$1\frac{1}{4}$
Intestine in length.....	30	19	30	$33\frac{1}{2}$	27	29
Cœca	$\frac{2}{12}$	$\frac{1}{12}$	$\frac{2}{12}$	$\frac{2}{12}$	$\frac{1}{12}$	$\frac{2}{12}$
Rectum.....	$3\frac{1}{2}$	—	$3\frac{1}{2}$	$3\frac{1}{2}$	3	3
Cloaca in width	—	—	1	1	1	$1\frac{1}{12}$

The individual of which the intestine was only nineteen inches long is mentioned in my work on the Rapacious Birds of Great Britain as the smallest seen by me, and only twelve inches in length. Facts like these shew that in birds the length of the intestinal canal varies in birds as much as in quadrupeds. The scutella are pretty regular as to number in this species.

Habits.—The manner of life of this elegantly formed and wonderfully ~~marvellously~~ agile little hawk is ~~better~~ comparatively well known ~~than that of the congenerous Goshawk~~, it being the most common and most extensively dispersed of our native species of diurnal plunderers. In spirit, activity, dexterity, and daring, it has no superior, and in these respects contrasts strongly with the Eagles and Buzzards, which yet are not sluggish birds, although we are apt to consider them as such, when we compare them with the Falcons. The ground, the tree, the fence-rail, or the stone wall, merely afford it a resting-place, or a point of observation,

for, like most of the Raptores, it is incapable of walking efficiently, the curiously prominent pads on its soles, and its beautifully taper claws rendering such mode of progression impracticable, no hawk having the power of retracting the latter organs in the manner of the Feline tribe, or in such a degree as to prevent their points from touching the ground. Its flight, however, is in some respects unrivalled, and while its wings are of sufficient length and breadth to give it a velocity nearly equal to that of the Merlin, its tail is so large and mobile as to enable it to execute with never-failing promptitude the most abrupt turnings, as well as the most delicate declensions.

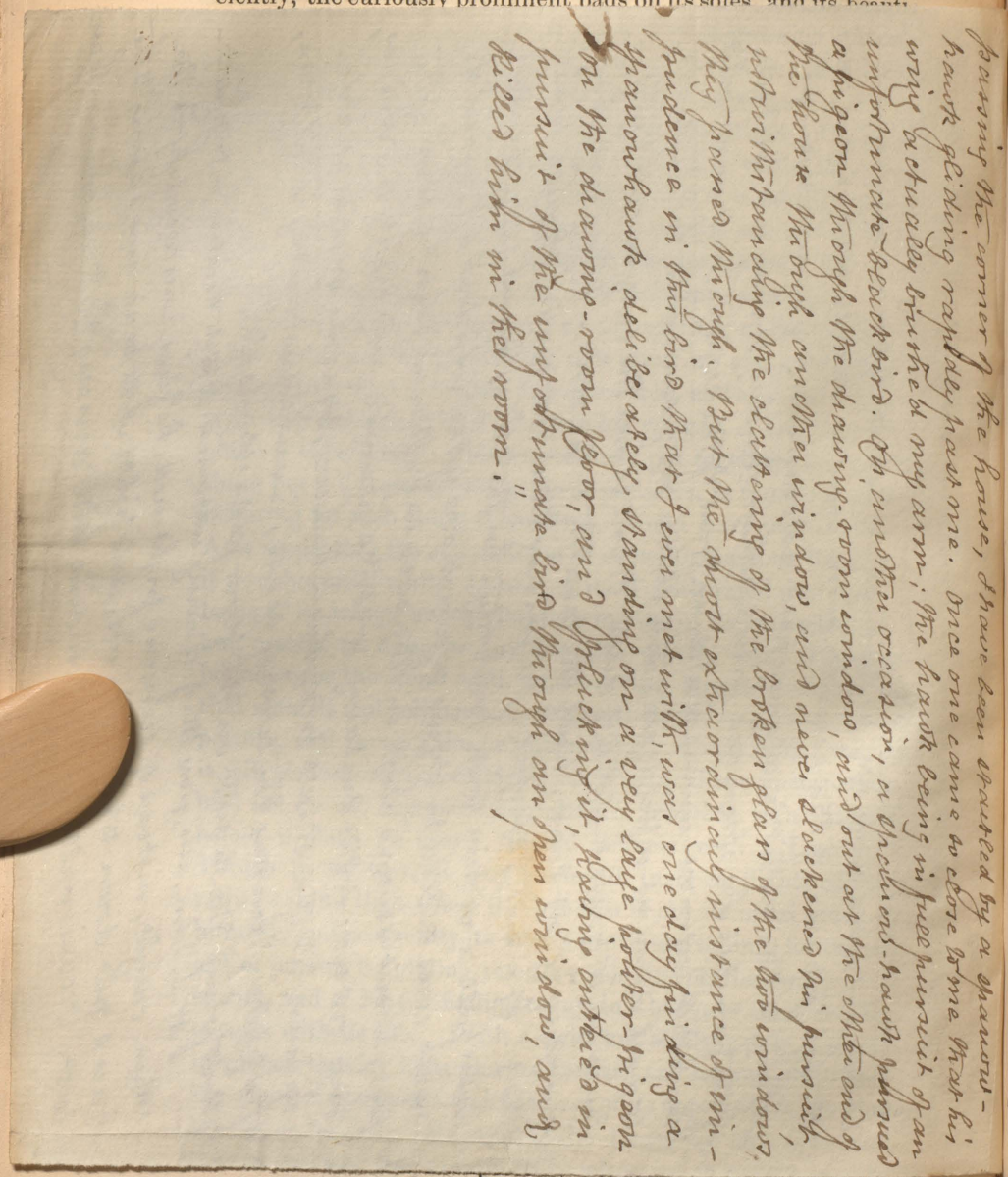
There it comes, silently and swiftly gliding, at the height of a few feet, over the grass field, now shooting along the hedge, now gliding over it to scan the other side, and again advancing with easy strokes of its half-expanded wings. A beautiful machine it is certainly, and marvellously put together, to be nothing but a fortuitous concourse of particles, as some wise men, believing no such thing themselves, would have us to believe. As if suspecting the concealment of something among the grass, it now hovers a while, balancing itself with rapid but gentle beats of its wings, and a vibratory motion of its expanded tail; but, unable to discover any desirable object, away it speeds, bounds over the stone wall, and curving upwards alights on that stunted and solitary ash, where it stands in a nearly erect posture, and surveys the neighbourhood. From such a station it will sometimes dart suddenly on some perhaps unsuspecting bird not far off, but more frequently it proceeds to a distance before it finds its prey. Should it meet with a Lark or a Thrush in its way, it may pursue it in open flight, gliding rather behind than above it; but this is not its usual mode of hunting, and frequently its efforts prove unavailing, for the object of pursuit by gliding to either side during the swoop of its enemy, and at length finding refuge in a hedge or thicket, often escapes with its life. With a swift but stealthy pace it speeds in silence, casting keen glances beneath and around, until finding a bird unprotected and heedless of its approach, it clutches him in an instant. So rapid is the descent of this plunderer that to one who has unexpectedly witnessed it, nothing can be

Numerous examples of its daring are recorded in ornithological works and others relating to natural history and ~~shooting~~ field-sports. Thus, Mr. Thompson, in his "Natural History of Ireland", v. I. p. 66, among others, gives the following:- "some years ago, at Springvale, county of Down, one dashed through a pane of the drawing-room window at a small bird ~~was~~ caged within, to the no little alarm and astonishment of several members of the family. An observant friend, when one day driving in to Belfast, remarked almost immediately in front of the vehicle, a Sparrow-hawk dash down at a field-pane, and strike the ground with so much violence as to raise a cloud of dust. It rolled over the body several times,- measuring, at least, half the breadth of the road,- before recovering itself. It is not, therefore, surprising that this species should sometimes fall a victim to its temerity. On the 12th of August, 1847, an adult male was killed by flying against one of the windows of Belfast College, about seven o'clock in the evening. It was seen by some of the boys outside of the building, to strike against, and break the window, in pursuit of a small bird, which, however, by some means escaped. The porter, hearing the crash of glass, hurried instantly to the room, and found the hawk on the floor perfectly dead."

Mr. St. John, also, gives the following instances of its heedless intrepidity:- "When caught, instead of seeming frightened, he flies courageously at the hand put down to pick him up, and fights with beak and talons to the last. Occasionally, when standing still among the trees, or even when

much more surprising. I have seen a Sparrow Hawk rush [illegible] the midst of a dense thicket and suddenly emerge

for, like most of the Raptores, it is incapable of walking efficiently, the curiously prominent pads on its soles, and its beauti-



much more surprising. I have seen a Sparrow Hawk rush headlong into the midst of a dense thicket, and suddenly emerge on the other side carrying off a thrush in his talons. How a bird at its utmost speed could thread its way between branches and twigs seems almost incredible. When it steals upon the farm-yard or orchard, it will sometimes make a dash at a bird without succeeding, and pass along; or, should the bird fly off, it may pursue it in open flight. On two occasions of this kind, I have seen a Thrush escape by entering a house, and sometimes the hawk has been known to follow the trembling fugitive thither. When a favourable opportunity occurs, it is often quite heedless of the presence of man, and I have seen one come suddenly upon some Pipits and Wagtails feeding in a field in which three ploughs were going, and carry off one of the Pipits from within a few yards of one of them. While some Sparrows were quietly enjoying the pickings of some horse-dung on one of the streets of Edinburgh, on which many persons, including Mr Audubon and myself, were passing, a Sparrow Hawk glancing among them carried one off in a moment.

That rapacious birds, when intent upon their prey, or pressed by the cravings of hunger, are sometimes unguarded or insensible to danger, is strikingly illustrated by the following anecdote, for which I am indebted to Mr Weir: "Mr David Smith informed me that in May 1837, when on board of the St. George steam-boat, which sails between Newhaven and Kirkaldy, a Lark alighted upon the rigging of the vessel, when about a mile from Seafield, closely pursued by a Sparrow Hawk, which in this situation darted at it, and pulled out most of the feathers of its tail; but the bird having escaped flew upon the deck in the midst of the passengers, still followed by its enemy. For two or three seconds both birds stood within a very short distance of each other. The poor little songster, upon recovering from its fright, took wing, but, alas, was very soon overtaken by the hawk, which was observed carrying it off in triumph suspended from its claws."

This clever little bird never soars in lazy gyrations like the Eagles and Buzzards, nor does it follow a circling course while looking for food. Its range of distinct vision cannot be very

great, as it does not appear to observe birds in a hedge or field at the distance of some hundred yards, and its low flight, at the height of only eight or ten feet, indicates a correspondingly short extent of sight. But then the quickness of its perception is astonishing, for when sweeping along nearly at full speed, it will readily discover any object favourably situated for being seized. In the fields, it preys on leverets, young rabbits, field-mice, partridges, larks, pipits, and wagtails; by the hedges and in woods, on blackbirds, thrushes, sparrows, chaffinches, and buntings. Although it very frequently visits stack-yards, gardens, and the vicinity of houses, its chief object seems to be to obtain small birds, not to look after the poultry; yet it has been known to seize on pigeons, and more frequently on chickens. Montagu says he has "frequently known them carry away half a brood of the latter before the thief was discovered. They fly low, skim over a poultry-yard, snatch up a chick, and are out of sight in an instant." Its depredations in the fields and in game-preserves render it highly obnoxious to the keepers, so that it is often shot; its occasional attacks upon tame birds in cages render it hateful to the fair owners of these interesting pets, and its visits to the farm-yard and barn-door are little approved of by thrifty housewives. Its good qualities, its indomitable courage, love of liberty, extreme agility, and elegant figure, are forgotten, and all classes join in persecuting the little plunderer. It does not appear that it has any deadly enemies among birds or quadrupeds, and of the former few ever attempt to molest it, unless when it has attacked a nest, and is bent on carrying off the young. A pair of Missel Thrushes will sometimes defend their nest against it, and that successfully, although sometimes one falls a sacrifice.

Mr Weir informs me that it is very difficult to decoy the Sparrow Hawk into a trap. "The only one," he continues, "which I ever had, taken in this way, was the one that I presented to you in April 1838. It was caught by Mr George Craven, gamekeeper to P. G. Skene, Esq., on his property of Pitlour, in the parish of Strathmiglo, Fifeshire. Having observed the hawk one morning pounce upon a pigeon, he allowed him to devour a part of it before he chased him away.

He then took the remaining portion and fixed it to the ground, placing around it three or four rat-traps, in one of which he was caught by the leg. He told me that in his neighbourhood he had been observed to make sad havoc amongst the partridges and pigeons."

When a Sparrow Hawk suddenly appears in a place where there are many small birds, they usually betake themselves to the nearest wood or thicket, where after a little they give vent to their feelings in loud cries. Sometimes it is pursued by birds of various species, which, although incapable of seriously molesting it, continue to hover round it, uttering cries expressive of their alarm and hatred. I have seen one flying rapidly off in the evening with a bird in its talons, followed at full speed by a Wagtail, uttering hurried cries all the while. In this case it is probable that the hawk had carried off its mate or one of its young. I think, however, that the birds on which it usually preys do not gather about it or pursue it unless some of their relatives or companions have been swept away by it. Often, however, a flock of Swallows follow a Sparrow Hawk a long while, hovering at a considerable distance, and keeping up an incessant chatter. The prevalent idea on this subject is, that small birds being the natural prey of hawks, they have an instinctive antipathy to their destroyers, and when one of the latter is observed, they call to each other, and collecting in a band, assume a sufficient degree of courage to impel them to pursue and harass him, knowing that their number secures them against an attack, as in his perplexity he cannot fix upon an individual. To this it may reasonably be objected that, having no power, even when united in bands, to oppose a hawk, these birds ought naturally to conceal themselves from his view, in order to ensure their safety. After attending to this subject for some time, and observing that in most cases, the hawk when pursued by small birds had one of them in his talons, and was thus so encumbered as to be incapable of molesting them, I am still of the same opinion as when I offered the following solution of this question:—"How does a bird, which under ordinary circumstances manifests extreme terror at the sight of another, under other circumstances muster suf-

ficient courage to pursue it? Is it certain that a hawk is unable to single out a bird from a flock; or, is there more reason to think that a troop of swallows, which have no weapons that could inflict the least injury on a hawk, could in the smallest degree affect it with fear? It is observable in our own species, that cowards, the moment the danger is over, assume so much more courage than is natural to them, that in the midst of the excitement they will even make a venture which in ordinary circumstances they would not have courage to do. The small birds that we speak of are all cowards, in the presence of hawks at least, and when one of the latter comes unawares among them and carries off one, or passes over without pursuing them, they soon recover from their fright, and being elated beyond their ordinary state, in a degree corresponding to their former depression, they muster spirit enough to go on for some time with a mock pursuit." It is this sudden revulsion when the danger is over, that renders clamorous in the trees birds which were perfectly silent when the hawk was gliding past them.

With the view of presenting as complete an account of this bird as possible, I shall now introduce a notice respecting it from the pen of my friend Mr Hepburn.

"The Sparrow Hawk is common in all the cultivated parts of East Lothian. When searching a field it sometimes hangs in the liquid void precisely like the kestrel. In the dim twilight I often see it coursing about its favourite hunting-grounds, on the lookout for some bird that may have incautiously roosted within reach of its formidable grasp. For many years an individual of this species has almost daily visited our stack-yard during the winter season, generally betwixt noon and three o'clock. As he glides in lowly flight over the fields to his larder, as the stack-yard may be termed, his detested presence is first announced by the 'twink' of some Chaffinch perched on a tall tree. Its companions repeat the alarm-cry, and in company with Buntings and Linnets fly up to the trees, a few perching on the bushes. The Sparrows feeding near the barn-door seek the middle of the neighbouring hedge, or betake themselves in a compact flock to the shelter of the evergreens in the garden, where they remain perfectly quiet till the danger

is over. Not so the other birds, which, from their commanding position, emit cries expressive of their fears. The clear notes of the Chaffinch are distinguishable above the rest. Two or three hundred of these birds twinking in chorus produce a fine effect on a calm frosty day like this. The Hawk now perches for a minute or so on the hedge, and as the stacks screen him from view, the fears of the poor birds subside for a little; but there he comes; swift as the arrow from the bow he rushes from between the stacks, gains the plantation, dashes fearlessly among the bushes after the fugitives, clutches his quarry, and is off as swiftly as he came. Sometimes, when he has stealthily approached the garden, without being observed, perhaps the noise of a party of Sparrows squabbling amongst themselves attracts his attention. Swift as thought he glides along the walk; if the bushes are too thick for a dash he flies rapidly round them; then woe to the wretched creature that first meets the glance of his keen eye. At another time he has found a flock of Sparrows in the close-pruned hedge that surrounds the stack-yard. He first beats one side, then the other, the birds always betaking themselves to the opposite side; and thus he persecutes them till one in its fright exposes itself. A shriek follows, and all is over. I only once observed this hawk rush from a great height in the air upon a flock thus circumstanced. Its usual manner of approaching its prey is by gliding close over the ground.

"It follows an ingenious method of procuring a choice supply of food from August to November, when the leaves are on the trees that surround our dwelling. Not far from the garden-hedge is a row of tall willows. Within the garden, and not fourteen yards from them, stands a beautiful white birch, which shoots up to the height of about twenty-four feet. Its stem is entwined with an aged honeysuckle, in which for the last three years ten pairs of Sparrows have built their nests, which in some places embrace the entire circumference of the stem, while in others they are piled irregularly above one another. Softly and warily does the Sparrow Hawk glide into one of the topmost boughs of the willows, and keen are the glances of his bright eye, which grows brighter when he sees the Sparrows

bickering in the honeysuckle. Balancing himself on his perch, with half-opened wings, and levelling his neck for flight, down he rushes. The yelloping instantly ceases; then what a rustling of the leaves of the neighbouring bushes, followed by a death-yell! and now you see the bold robber bearing away his bloody victim to some quiet corner to devour it at leisure. I have seen Pipits, Larks, Wagtails, and Swallows evade the swoop of this fell destroyer by dexterously darting to one side, rising above the pursuer, again darting aside, and rising as he descends, and so on, gradually diminishing the distance from the earth, until the persecuted bird finds a shelter, or the tyrant gives up the pursuit in disgust. What a treat it is to behold the elegant evolutions performed by both parties!

"This hawk preys chiefly on small birds, partridges, leverets, and young rabbits. Should the gamekeeper disturb it when feasting, he sets a trap near the remains, and is often successful in capturing it. It is sometimes caught in traps baited with dead rabbits. It is very fond of washing. Here it prefers the branches of the old oak in the wood for building its shallow nest of slender twigs, in which it deposits from three to five eggs. The young I have seen fledged so late as the 30th of July, but the usual time is about the end of June.

"One evening in June 1838, on my way home from fishing, I walked through a wood near Ruchlaw mill. Observing a number of rabbits gambolling in a green glade, I stood to see their sports, when in a short time a Sparrow Hawk swept down from a neighbouring ash, and fixed his claws into an old one, which rushed shrieking to the brink of a precipice overhanging Whittingham Water. Running forward I arrived in time to see both saved from certain death, by being caught by a briar bush growing on a little natural platform. Still the hawk kept his hold, till I shouted, on which he flew off."

The Sparrow Hawk is dispersed over all parts of Britain, but is more plentiful in the cultivated districts than in the heathy or mountainous portions of the country. In the Outer Hebrides, where there are no trees, it breeds in rocks; but in wooded districts, it either builds its nest in a tree, or, more frequently, takes possession of the deserted nest of a Crow.

When formed by itself, its nest is nearly flat, composed of sticks and slender twigs, rudely put together, with some grass, moss, or wool in the central small depression. The eggs, from three to five in number, are very broadly ovate or roundish-elliptical, bluish-white, blotched and irregularly spotted, sometimes sparingly, sometimes profusely, with umber-brown of various shades; the largest in my collection is an inch and eight-twelfths long, an inch and four-twelfths in breadth, the smallest an inch and seven-twelfths in length, and an inch and a quarter in breadth.

"In one of the plantations on Boghead," Mr Weir writes, "for several years past a pair of Sparrow Hawks have reared their young, either in the deserted nest of the Carrion Crow or Magpie. They were uncommonly bold, and with the rapidity of an arrow skimmed over the ground. Amongst partridges, pigeons, and other smaller birds, they committed great destruction. With almost unerring aim they pounced upon their prey. From a hut formed of the branches of trees I watched for several hours the habits of a pair of these voracious birds whilst they were engaged in feeding their young, which were nearly half fledged. During the time that I remained in it, the female continued to sit upon them. The male, sometimes at shorter, and at other times at longer intervals, alighted upon the top of a tree, at the distance of about forty yards from the nest, with a bird in his talons. The female always took it from him, and divided it amongst her nestlings. Sometimes he arrived with a blackbird or a thrush, but more frequently with a lark, a yellow bunting, or a chaffinch. Being anxious to know whether the male is in the habit of feeding his offspring, I one morning, in a place of concealment, watched another pair of them for four or five hours. The male always alighted, as in the former case, upon the top of a tree at some distance from the nest, with a bird in his claws, and called upon his mate, who came and caught hold of it in her bill. I shot her as she was carrying it to her young. About nine o'clock in the morning I went home. At six in the evening I returned with a boy, who climbed the tree to see what was in the nest. He had no sooner looked into it, than with asto-

nishment he exclaimed, 'Ah! Sir, the poor little things are gasping.' They were in fact almost suffocated by the dead birds about them. He threw down no less than sixteen, amongst which were larks, yellow buntings, chaffinches, hedge-sparrows, and green linnets. I took home the young, which were four in number. They seemed not to have been fed during the day, as they were exceedingly hungry. In these two instances it would appear that the male bird provided the food, but did not give it to his family. Whether this is always the case with the Sparrow Hawk I cannot ascertain until I have further opportunities of observing their habits."

In Ireland.

Young.—The young are at first entirely covered with soft white down. Their feet are yellow, the claws dusky, inclining to flesh-colour at the base. The first plumage, when the feathers are but partially grown, is dark greyish-brown on the upper parts, the feathers terminally margined with light red, and on the lower parts light red barred with dusky. When fully fledged they have the cere greenish-yellow, the bill dusky at the end, pale blue with some yellow at the base, the iris light brown, the feet greenish-yellow. The feathers of the upper parts are greyish-brown, margined with light red, that colour prevailing on part of the hind-neck, those of the nape white excepting the tips, the scapulars with two large reddish-white spots; the tail-feathers are wood-brown, the two middle with four, the lateral with six dusky bands. The lower parts are dull reddish-white, the throat and part of the neck with longitudinal linear dusky streaks, the breast and sides barred with dusky, there being generally four dusky bars on each feather, that toward the end heart-shaped and pointed; the lower tail-coverts reddish-white; the lower wing-coverts pale reddish, barred with dusky; the spaces between the dark bands on the inner webs of the quills reddish-white.

Progress toward Maturity.—In the first plumage there is little difference between the male and the female. In the second, the male and female are of the same greyish-brown above, the feathers narrowly bordered with light red. The lower parts are more tinged with red, and more broadly barred, in

the male than in the female. As the birds advance in age, the

p. 360.

"In Ireland," says Mr. Thompson, "I have known this bird to build in trees only; but according to Macgillivray," in the outer Hebrides, where there are no trees, it builds in rocks." He then states that in Hillsborough Park, according to the game-keeper, it always constructs a nest for itself; while the Kestrel, on the contrary, takes possession of the old nest of some other bird, as that of the magpie, &c. — A correspondent, (Mr. J. Cooke) writing from the south of Ireland, remarks, that he has never known the sparrow-hawk use the nest of another bird, but always to build one for itself; adding, that "the structure is little more artificial than that of the ring-dove, being merely a wide and shallow platform of sticks, without any lining, except some accidental feathers of the old birds, or their prey." Three facts are mentioned, as in some places, the sparrow-hawk would seem, like the Kestrel, to appropriate to itself the old nests of other birds." Seem is not the correct word here: it does make use of the nest of another bird occasionally, as Mr. Ives states above. As to its breeding on rocks in the Hebrides, where it cannot well breed elsewhere with safety, there needs be no doubt, seeing that in Morayshire and the neighbouring track, where there are woods as well as rocks, and more of the former than the latter, it "the sparrowhawk," according to Mr. St. John, "sometimes builds on rocks, and sometimes in trees."

than bluish or grey; the breast, lower part of the body, and

nishment he exclaimed, 'Ah! Sir, the poor little things are

parts are more tinged with red, and more broadly barred, in

the male than in the female. As the birds advance in age, the brown or dusky bands on the lower parts of the male become converted into light red, which colour ultimately predominates; whereas in the females, the reddish colour gradually disappears, the bars becoming dusky and then deep grey, their intervals reddish-white and then greyish-white. The upper parts change from brown to deep greyish-blue in the male, and to brownish-grey in the female. I have seen a few old females, however, of as blue a tint as the males. The bars on the wings and tail become fainter the older the bird is, but without varying in number; there being six on the outer and four on the middle tail-feathers in both sexes.

Remarks.—The habits and gradations of plumage of the Sparrow Hawk are satisfactorily known, and have been more fully described in the preceding pages than they have hitherto been. The numberless differences in tints and markings, as well as in size, have led some ornithologists to divide this species into two or more. Having been at one time impressed with the idea of there being two species in Britain, I have paid much attention to the subject, and examined about a hundred individuals, until, having traced the gradations in the two sexes, I am convinced that we have only one Sparrow Hawk in Scotland at least. As to the difference in size between the sexes, it is by no means greater than is observed in the American Accipiter fuscus and A. Cooperi, birds which have a wonderfully close resemblance to A. Nisus, although differing in size, the male of A. Cooperi being about equal to the female of A. Nisus, and the male of the latter considerably larger than that of A. fuscus.

By a note in the third part of M. Temminck's Manual, it appears that Mess. Becker and Meisner have invented a greater Sparrow Hawk, Falco nisus major, which is said to have the bill strong, the cere yellowish-grey, the iris and feet lemon-yellow; the head greyish-brown marked with numerous white spots; the nape brownish, here and there marked with white feathers; all the upper part of the body and tail more brownish than bluish or grey; the breast, lower part of the body, and

thighs barred with dusky on a white ground; tail with five bands and a terminal light brown band, its lower surface dull white. It differs from the smaller species—1st, In being larger; the tail an inch and a half longer; 2dly, In having the eggs larger, more rounded, greyish-white, and only dotted with brown at large intervals; 3dly, In the male and the female being almost precisely similar; 4thly, In the males having no reddish-brown on the belly or thighs. On this subject I would offer a few remarks. Young males of the common Sparrow Hawk often have no red on the lower parts, and in this state are very similar to old females; individuals of either sex vary as much as to render the tail of one two inches longer than that of another individual of the same sex. As to the eggs, one finds in the same nest a large egg and one considerably smaller, a blotched egg, an egg merely dotted, and an egg almost destitute of markings. The colouring as above given differs in nothing from that of many common Sparrow Hawks, excepting in the white spots on the head, and the different number of bands on the tail, both of which circumstances may be incorrectly stated. Finally, however, it is very possible that two species may be confounded under the same name.

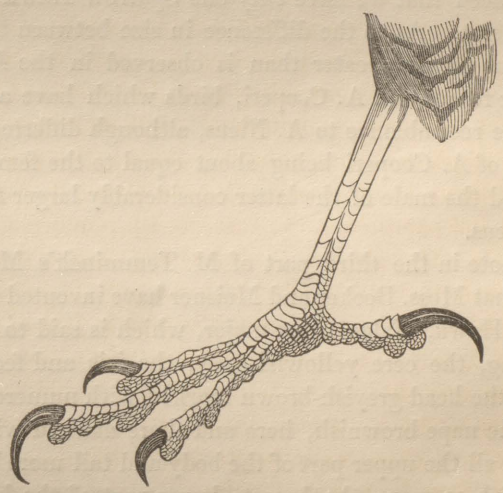


Fig. 229.

Genus XI. CIRCUS. HARRIER.

The birds which constitute the genus Circus are remarkable for presenting characters indicative of an approximation to the Owls on the one hand, and on the other to the Hawks, properly so called, and the Buzzards.

The bill is short, as broad as high at the base, compressed and attenuated toward the end: upper mandible with its dorsal outline declinate and nearly straight as far as the edge of the cere, then decurved in about the fourth of a circle, the ridge on the cere broad and flattened, afterwards narrow but convex, the sides rapidly sloping and moderately convex, the edges with a broad festoon, the tip deflected, subtrigonal, acute; lower mandible with the angle medial, wide, and rounded, the crura sloping upwards and feathered, the dorsal line somewhat convex, the back broad, the sides rounded, the edges involute, beyond the middle sharp and slightly arched, the tip obliquely truncate. Figs. 230, 231, 233, 234.

Mouth wide; upper mandible concave beneath, with a groove on each side, and thin projecting margins; lower mandible deeply concave, its edges fitting into the grooves of the upper. Palate flat, with two longitudinal papillate ridges; posterior aperture of nares oblong, anteriorly linear, with papillate margins. Tongue short, fleshy, concave above, horny beneath, sagittate and papillate at the base, its tip rounded and slightly emarginate. Œsophagus, Pl. XXI, Fig. 3, *a b c d*, very wide, with an extremely large crop, *b c*; its proventricular portion, *d e*, much dilated, and having a complete belt of glandules. Stomach, *e*, very large, round, somewhat compressed; its muscular coat very thin, being composed of a single series of fasciculi, its tendinous spaces small. Pylorus without valves; intestine, *e f j*, of moderate length and width; cœca very small, cloaca, *j l*, very large and globular.

Nostrils large, ovato-oblong, in the middle and fore part of the cere, and having an oblique plate from the upper edge. Eyes large ; eyelids feathered and ciliated ; the lachrymal ridge not projecting. Aperture of ear very large, elliptical or oblong, with a bare space extending from it to the base of the lower jaw.

Head of moderate size, ovate ; neck rather short ; body very slender, much compressed behind. Tibia long and muscular ; tarsus long, slender, compressed, with a series of large oblique scutella on the fore and outer part, reticular oblong scales on the sides, and scutella behind, unless at the upper and lower parts. Toes rather small, slender ; prominently padded beneath, scutellate above unless at the base ; the third and fourth connected by a pretty large basal web ; first stouter, but considerably shorter than the second, third much longer, fourth longer than the second. Claws long, moderately curved, slender, compressed, rounded above, flat beneath, tapering to a fine point. Those of the first and second toes much larger, that of the third with a dilated thin inner edge. Fig. 232.

Plumage very soft, and generally blended. Loral spaces and sides of the cere covered with rather long, bristle-tipped plumelets, partially concealing the nostrils. Feathers oblong, and rounded ; those of the head of moderate length, of the neck bulky. A distinct ruff of narrow decurved feathers extends from behind the eye to the throat. On the sides the feathers are elongated, on the abdomen downy, on the outer part of the tibia long. Wings long, broad, much rounded, of twenty-three quills ; primaries rather broad, obtuse ; the fourth and third longest, the first much shorter, being about equal to the seventh ; the outermost four having the inner web sinuously cut out toward the end ; and with the outer web attenuated ; secondaries broad, broadly rounded, with a minute tip. Tail long, nearly even, or rounded, of twelve broad rounded feathers.

In this genus the general appearance approaches to that of Accipiter. The bill is intermediate in form between that of Accipiter and Buteo ; the elongated tarsi resemble those of the former genus, and the toes might belong to either. The plumage, especially in the females, is almost as soft as in some

owls, and in them its colours farther indicate an affinity, which is more decidedly shewn by the structure of the ear, and the ruff of oblong feathers. It seems somewhat strange, however, that the digestive organs make no approximation to those of owls; for while in the latter the œsophagus is of uniform width throughout, and the cœca are large and oblong, these parts are in the Harriers much the same as in Buzzards.

The Harriers, when searching for food, fly low, with a gliding and gentle motion, often in circles, pounce upon small quadrupeds, birds, and reptiles, or sometimes pursue birds in open flight, and feed occasionally on insects and fishes. They nestle on the ground, laying three or four eggs, migrate from the colder districts at the approach of the cold season, and as a genus are very extensively distributed on both continents. Three species are found in Britain: the Ring-tailed, Montagu's, and Moor or Marsh Harriers.

The accompanying figure represents the head of a female of the common or Ring-tailed species.



Fig. 230.

Linn.

1. CIRCUS CYANEUS. THE ~~RING-TAILED~~ Blue HARRIER.

White Hawk. Blue-Reeves.

COMMON HARRIER. HEN HARRIER. BLUE HAWK. BLUE KITE. BROWN KITE. BLUE OR BROWN GLEDE. BREID-AIR-TOIN.



FIG. 231.

Falco cyaneus. Linn. Syst. Nat. I. 126. Male.
Falco Pygargus. Linn. Syst. Nat. I. 126. Female.
Falco cyaneus. Lath. Ind. Orn. II. 39.
Falco cyaneus. Mont. Trans. Linn. Soc. IX. 182.
Busard Saint Martin. Falco cyaneus. Temm. Man. d'Orn. I. 72.
Hen-Harrier. Circus cyaneus. Selb. Illustr. I. 68.
Buteo cyaneus. Hen-Harrier. Jen. Brit. Vert. An. 89.

The wings extending to about two inches from the tip of the tail; the fourth quill longest, the third almost equal. Male with the plumage light bluish-grey, the outer primaries black toward the end, the tail-coverts white. Female umber-brown above, pale reddish-yellow longitudinally streaked with brown beneath, tail-coverts white. Young similar to the female, with the tints richer.

Male.—The Common or Ring-tailed Harrier is of a slender elongated form, although its body, when the feathers are removed, is found to be short, as in the Owls. Like them also it is very light, so that the bulk of the bird consists chiefly of its plumage. The head is rather large; the bill slender, when compared with that of the falconine species hitherto described.

The upper mandible is somewhat concave within, the lower deeply so, and having a median prominent line. The tongue is eight and a half twelfths long, fleshy, saggittate and papillate at the base, concave above, horny beneath, and with the tip rounded and slightly emarginate. The œsophagus, Pl. XXI, Fig. 3, *a b c d*, is six and a half inches long, wide, dilated into a crop, *bc*, which when fully distended is three inches in width; then contracted to ten-twelfths, and again at the proventriculus, *d h*, dilated to an inch and a half. The glandules are very small, and form a continuous belt nearly an inch in breadth. The stomach, *e*, is roundish, somewhat compressed, an inch and three-fourths in diameter; its muscular coat extremely thin, the inner soft, the tendinous spaces about a third of an inch in breadth. The intestine, *e f h j*, is thirty-four inches long, from three-twelfths to a twelfth and a half in width; the rectum three inches in length, with a large globular cloacal dilatation, an inch in diameter. The cœca are extremely small, oblong, two-twelfths in length, and one-twelfth in width. The pylorus has a thickened margin, without knobs, but with two small ridges. The two lobes of the liver are nearly equal in size; and there is an oblong gall-bladder, half an inch in length.

The eyes are large, and the eyelids are feathered, and margined with ciliary bristles; the supraocular ridge also feathered. The nostrils large, ovato-oblong, with an internal oblique ridge from the upper part. The aperture of the ear is elliptical, very large, half an inch in length, and margined with slender recurved feathers. From its inferior margin proceeds downwards and forwards to the base of the lower jaw a narrow space of bare skin nearly three quarters of an inch long. The tarsi are feathered anteriorly about a third of their length, rather long, slender, with eighteen large anterior oblique scutella, of which

the lower are smaller, the sides reticulated with subhexagonal scales, the hind part with twelve scutella, and hexagonal scales above and below. The toes are small, the outer connected with the third by a basal web of considerable size; the first considerably shorter than the second, the fourth a little longer than the latter, the third much longer; all scutellate above, unless at the base, tuberculate and papillate beneath, there being a long fleshy pad or tubercle on the last joint of each, and one on the next joint of the outer two; the first toe with six, the second with five, the third with seventeen, the fourth with seven scutella. The claws are long, compressed, rounded above, flat beneath, curved in the fourth of a circle, tapering to a fine point; those of the first and second toes largest, that of the third with a thin internal edge. Fig. 232.

Plumage very soft, blended, somewhat compact on the wings and back; otherwise as described in the generic character. The wings are long, broad, and much rounded; the fourth quill longest, the third two-twelfths of an inch shorter, the second an inch shorter than the third, and the first two inches and a half shorter than the second, and about equal to the seventh. The first five have their outer webs attenuated toward the end, and the first four are sinuate on the inner webs; the secondary quills broad and rounded. The tail is long, straight, of moderate breadth, nearly even, the lateral feathers being about three-fourths of an inch shorter than the longest.

The bill is bluish-black, the cere yellow, the inside of the mouth dark bluish-grey; the iris yellow; the tarsi and toes orange-yellow, the claws black. The general colour of the plumage is light greyish-blue; the head and scapulars of a deeper tint; the hind part of the back paler, the upper tail-coverts white, as are the bases of the occipital feathers. The outer six primaries are black, on the outer web tinged with grey, but at the base white; the rest and the secondaries of the general colour on their outer webs, but on the inner whitish and obscurely mottled with dark grey. The middle feathers of the tail are of a lighter tint than the back, and the rest gradually become paler until the outer web of the lateral becomes white; the inner webs of all but the two middle white, with eight

bars of dark grey. The bristle-tipped feathers of the loral space and cere are white at the base, black toward the end. The fore-neck, and anterior part of the breast are greyish-blue, paler than that of the upper parts; the middle of the breast, the abdomen, and tibial feathers bluish-white; the lower wing-coverts, the bases of the outer primaries, and the lower tail-coverts are white.

Length to end of tail $18\frac{1}{4}$ inches; extent of wings $39\frac{1}{2}$; wing from flexure 13; tail $8\frac{1}{2}$; bill along the ridge $1\frac{1}{12}$, along the edge of lower mandible $1\frac{1}{12}$, width of mouth 1; tarsus $2\frac{8}{12}$; hind toe $\frac{8}{12}$, its claw $\frac{9}{12}$; second toe $\frac{10}{12}$, its claw $\frac{11}{12}$; third toe $1\frac{5}{12}$, its claw $\frac{8}{12}$; fourth toe $\frac{11}{12}$, its claw $\frac{7}{12}$.

Female.—The female is much larger than the male, and differs so much in colour, that until not many years ago she was thought to be of a different species. The plumage also is softer, the ruff more conspicuous, and the feathers on the neck more developed. The œsophagus is five inches long, at the commencement ten-twelfths in width, then dilated into an enormous crop three inches and a quarter in length behind, two inches and ten twelfths in depth, and two inches and a quarter in breadth; its width is then one inch, and the proventriculus expands to an inch and a half. The stomach is oval, somewhat compressed, two inches long, its tendons five-twelfths in diameter. The intestine is thirty-five inches in length, with a width of four-twelfths in the duodenal portion, and of but little more than one-twelfth toward the cœca, which are only one-twelfth in length; the rectum, at first half an inch in width, enlarges, and is dilated into a globular cloaca an inch and a half in diameter. The fourth quill is one-twelfth longer than the third, which exceeds the second by ten twelfths, and the first is two inches and three-fourths shorter than the latter. The lateral tail-feathers are nearly three-fourths of an inch shorter than the longest.

The iris is yellowish-brown, but the bill and feet are coloured as in the male. The general colour of the upper parts is umber-brown, the upper part of the head is deep brown, the feathers slightly edged with light yellowish red; the anterior

part of the forehead, a band over the eye, and the loral space, pale reddish-yellow; the bristle-tips at the base of the bill black. The feathers of the cheeks are dull brown edged with yellowish-red; those of the ruff light yellowish-red, with a medial brown band. The upper hind part, sides, and fore part of the neck, the breast, and sides, are light reddish-yellow, each feather with an oblong umber-brown mark. Some of the long feathers on the sides have four light spots, like those of the female Merlin and Kestrel, and the central part of the outer tibial, abdominal, and subcaudal feathers, is light brownish-red. Many of the upper wing-coverts, and some of the scapulars, have one or two round, light red spots. The bases of the occipital feathers are white. The quills are umber-brown, slightly margined with paler, their inner webs whitish, broadly barred with dusky-brown, there being three bars on the outer and four on the next three. The upper tail-coverts are white, with lanceolate reddish-brown medial spots. The tail is white for about an inch at the base, deep brown in the rest of its extent, the four middle feathers with four greyish-brown bands, the rest with five bands of a light reddish tint; these bands much narrower than the intervening dusky spaces; the tips reddish-white. The lower wing-coverts are reddish-white, with a central brown spot; the lower surface of the primary quills is greyish-white, with conspicuous dark bars.

Length to end of tail 21 inches, to end of wings $18\frac{1}{2}$; extent of wings 46; wing from flexure 15; tail 10; bill along the ridge $1\frac{4}{12}$, along the edge of lower mandible $1\frac{4}{12}$; width of mouth $1\frac{1}{12}$; tarsus 3; first toe $\frac{9}{12}$, its claw $1\frac{1}{12}$; second toe $\frac{10}{12}$, its claw $1\frac{1}{12}$; third toe $1\frac{1}{2}$, its claw $\frac{11}{12}$; fourth toe $\frac{11\frac{1}{2}}{12}$, its claw $\frac{9}{12}$.

Variations.—Adult males vary in length from seventeen to nineteen inches, females from nineteen to twenty-one and a half. The scutella vary a little in number, except on the second toe, which in all the specimens examined by me has five. In the males, the blue of the upper parts varies in tint, being darker in young individuals, which have the bands on the tail also more distinct. In old males, the lower parts are often

pure white, the tail greyish-white, with the bars obsolete. The females exhibit less variation, but in old individuals the brown of the upper parts is lighter, and the tail is tinged with grey.

Changes of Plumage.—Toward the period of moulting, the tints fade very considerably, and the feathers become irregularly acuminate by being worn.

Habits.—Having examined the form, and somewhat of the structure of the Hen-Harrier, we are prepared for the exhibition of its faculties. Kneel down here, then, among the long broom, and let us watch the pair that have just made their appearance on the shoulder of the hill. Leave these beautiful flowerets to the inspection of that lank-sided botanist, who drags himself slowly along, with a huge tin cannister on his back, and eyes ever bent on the ground. Should he wander hitherward, he will be delighted to cull the lovely tufts of maiden-pinks that surround us; but *we* look heavenward, like the astronomers.

How beautifully they glide along, in their circling flight, with gentle flaps of their expanded wings, floating as it were in the air, their half-spread tails inclined from side to side, as they balance themselves, or alter their course! Now they are near enough to enable us to distinguish the male from the female. They seem to be hunting in concert, and their search is keen, for they fly at times so low as almost to touch the bushes, and never rise higher than thirty feet. The grey bird hovers, fixing himself in air like the Kestrel; now he stoops, but recovers himself. A hare breaks from the cover, but they follow her not, though doubtless were they to spy her young one, it would not escape so well. The female now hovers for a few seconds, gradually sinks for a short space, ascends, turns a little to one side, closes her wings, and comes to the ground. She has secured her prey, for she remains concealed among the furze, while the male shoots away, flying at the height of three or four yards, sweeps along the hawthorn hedge, bounds over it to the other side, turns away to skim over the sedgy pool, where he hovers a short while. He now enters upon the grass field,

when a Partridge springs off, and he pursues it, with a rapid gliding flight like that of the Sparrow Hawk; but they have turned to the right, and the wood conceals them from our view. In the meantime, the female has sprung up, and advances, keenly inspecting the ground, and so heedless of our presence that she passes within twenty yards of us. Away she speeds, and in passing the pool, again stoops, but recovers herself, and rising in a beautiful curve, bounds over the plantation, and is out of sight.

The Hen-Harrier feeds upon small birds and the young of larger, on young hares and rabbits, on mice, frogs, lizards, and serpents. For the most part, it pounces upon its victims as they repose on the ground; but it also pursues birds in open flight, and so far from confining itself to feeble game, as some allege, it has been known to seize the red grouse, ptarmigan, and partridge. Thus, my son, while searching for insects on the Pentland Hills, in the summer of 1835, saw a pair when flying low over the heath start a red grouse, which one of them captured after a short chase; and in September of the same year, Mr Martin, gamekeeper to the Earl of Lauderdale, shot a male as it was carrying off a bird of the same species. In the crop of one examined by me I found the remains of a grey ptarmigan, and several writers allege that it pursues not only partridges, but teal. Mr Slaney, for example, states that they "are very destructive to game. In shooting, the writer has seen the hen-harrier dart at a partridge which his dogs put up, and carry it off. By following the marauder some distance he got the partridge, which was quite dead, with a very slight mark on the head. Another day he shot the ring-tail, and on examining the spot where the hawk got up, found a partridge half devoured. This had been killed, as appeared by the feathers, at a little distance, but carried to the edge of a plash of water, where the plunderer had an opportunity of washing his beak and claws between every mouthful, and eating his quarry like a gentleman!—or rather, in this case, a lady."

In autumn When flying from one place to another, without searching the ground, it moves with considerable rapidity, at such a height as to clear the trees and other elevated objects without

"In the autumn," says Mr. St. John, "my partridges suffer much from the hen-harrier. As soon as the corn is cut this bird appears, and hunts the whole of the low-country in the most determined and systematic manner. The hen-harrier, either on the hill-side or in the turnip-field, is a most destructive hunter. Flying at the height of only a few feet from the ground, he quarters the ground as regularly as an old pointer, crossing the field in every direction; nor does he waste time in hunting useless ground, but tries turnip-field after turnip-field, and rushy field after rushy field, passing quickly over the more open ground, where he thinks his game is not so likely to be found. The moment he sees a bird, the hawk darts rapidly to a height of about twenty feet, hovers for a moment, and then comes down with unerring aim on his victim, striking dead with a single blow partridge or pheasant, grouse or black-cock, and showing a strength not to be expected from his light figure and slender though sharp talons.

"I saw on a hill-side in Ross-shire a hen-harrier strike a heath hen. I instantly drove him away, but too late, as the head of the bird was cut as clean off by the simple stroke as if done with a knife. On another day, when passing over the hill in the spring, I was attended by a hen-harrier for some time, who struck down and killed two hen-grouse that I had put up. Both these birds I ~~had~~ contrived to take from him, but a third grouse rose, and was killed and carried off over the brow of a hill before I could get up to him. There is no bird more difficult to shoot than this. Hunting always in the

open country, though appearing intent on nothing but his game, the wary bird, with an instinctive knowledge of the range of shot, will keep always just out of reach, and frequently carry off before your very face the partridge you have flushed, and perhaps wounded.

"Though very destructive to grouse and other game, this bird has one redeeming quality, which is, that he is a most skilful rat-catcher. Skimming silently and rapidly through a rickyard, he seizes on any incautious rat who may be exposed to view; and from the habit this hawk has of hunting very late in the evening, many of these vermin fall to his share. Though of so small and light a frame, the hen-harrier strikes down a mallard without difficulty; and the marsh and swamp are his favourite hunting-grounds. Quick enough to catch a snipe, and strong enough to kill a mallard, nothing escapes him. Although so courageous in pursuit of game, he is a wild, untamable bird in captivity; and though I have sometimes endeavoured to tame one, I never succeed in rendering him at all familiar. So he disdains to eat any animal not killed by himself, he is a very difficult bird to trap. The best chance of catching him is in what is called a pole-trap, placed on a high post in the middle of an open part of the country; for this hawk has (in common with many others) the habit of perching on upright railings and posts, particularly as in the open plains, where he principally hunts, there are but few trees, and he seldom perches on the ground. His flight is leisurely and slow when searching for game; but his dart, when he has discovered his prey, is inconceivably rapid and certain.

deviating. It is not, however, known to soar to a great height like the Buzzards and Eagles; but, when satiated, retires to some quiet place, or perches on a wall, a stone, or a stump, until digestion is advanced. Although its large eyes and ears would indicate a disposition to prey at night, I am not aware of its having been seen abroad later than the Sparrow Hawk. On obtaining its prey, it usually devours it on the spot, carrying it off only when it judges itself liable to be molested. It has obtained a reputation for its exploits in the poultry-yard, which with more propriety belongs to the Sparrow Hawk, although there is no reason to doubt its occasional abduction of a chicken. In its rambles, it searches the cultivated fields, as well as the pastures, but in summer and autumn is partial to heaths and commons; and in such places it reposes at night, and rears its young.

This species, although nowhere very common, is generally dispersed, and in some districts pretty numerous in the breeding season. In Scotland, it betakes itself to the hilly tracts and moors from the middle of spring to the end of autumn; but in winter frequents the lower cultivated districts. It is a permanent resident, and does not appear to receive any accession of numbers, or to undergo any periodical diminution. Being easily approached when it has young, and even when intent on searching for food, it is frequently killed by gamekeepers and others, so that specimens are easily obtained, and besides the six in my collection, I have examined probably thirty. In respect to frequency, it ranks, I think, next to the Buzzard, although there are districts in which it is extremely rare. Thus, I had one sent to me from West Lothian as an unknown species of Hawk, and in the northern isles it is very seldom met with. Owing to this partial scarcity of the species, I have not been favoured with any observations respecting it by my correspondents; and as I have never had the good fortune to find its nest, I am obliged to refer to a very valuable account of its breeding by Sir William Jardine, in a note in his Edition of Wilson's American Ornithology:—

"In a country possessing a considerable proportion of plain and mountain, where I have had the greatest opportunities of

attending to them, they always retire, at the commencement of the breeding season, to the wildest hills, and during this time not one individual will be found in the low country. For several days previous to commencing their nest, the male and female are seen soaring about, as if in search of, or examining, a proper situation, are very noisy, and toy and cuff each other in the air. When the place is fixed, and the nest completed, the female is left alone; and when hatching, will not suffer the male to visit the nest, but on his approach rises and drives him with screams to a distance! The nest is made very frequently in a heath bush by the edge of some ravine, and is composed of sticks, with a very slender lining. It is sometimes also formed on one of those places called scars, or where there has been a rut on the side of a steep hill after a mountain thunder-shower; here little or no nest is made, and the eggs are merely laid on the bare earth, which has been scraped hollow. In a flat or level country, some common is generally chosen, and the nest is found in a whin or other scrubby bush, sometimes a little way from the ground, as has been remarked in the description of the American birds. The young are well supplied with food, I believe by both parents, though I have only seen the female in attendance; and I have found in and near the nest the common small lizard, stone-chats, and young grous.

"When the young are perfectly grown, they, with the old birds, leave the high country, and return to their old haunts, hunting with regularity the fields of grain, and now commit great havock among the young game. At night they seem to have general roosting-places, either among whins or long heath, and always in some open spot of ground. On a moor of considerable extent I have seen seven in the space of one acre. They began to approach the sleeping ground about sunset; and, before going to roost, hunted the whole moor, crossing each other, often three or four in view at a time, gliding in the same manner as that described by Dr Richardson of the Circus Americanus. Half an hour may be spent in this way. When they approach the roost they skim three or four times over it, to see that there is no interruption, and then at once drop into the spot. These places are easily found in the day,

and the birds may be caught by placing a common rat-trap, or they may be shot in a moonlight night. In both ways I have procured many specimens."

The eggs vary from three to five, and are of a broadish elliptical form, and of a bluish-white colour, sometimes faintly dotted with brown, their average length an inch and three-fourths, their breadth an inch and four twelfths. The young are at first covered with white down.

Young.—When fledged, the young of both sexes resemble the adult female. The bill is brownish-black, the bases of both mandibles yellow, the iris dark hazel, the feet yellow, the claws brownish-black. The upper parts are deep umber-brown, the smaller wing-coverts with two spots of light red, the upper tail-coverts white, each with a reddish-brown lanceolate streak, the tail with four bands of light red; the hind-neck, ruff, and lower parts light yellowish-red, longitudinally streaked with dark brown; the lower surface of the outer quills, and the tail, very conspicuously barred. The males may be distinguished from the females by their inferior size.

Progress toward Maturity.—Montagu, who first ascertained the change which the male undergoes, gives the following description of one which he had reared from the nest, and which he killed in the middle of October, when in its second year, it having undergone no change in the first year, excepting in some new feathers of the wings and tail, which replaced those that had been plucked by him for the purpose. "The plumage of the Ring-tail, or female, still remains about the neck, the smaller coverts of the wings, the thighs, and part of the belly, intermixed with the male plumage; the top of the head and wreath have also a mixture of the feathers of both sexes; the quills, scapulars, and tail, are completely masculine; in the last of these are a few small broken bars of cinereous brown, on a white ground, in the three outer feathers, the exterior margins cinereous-grey; the six middle feathers are almost wholly grey, and the markings are very obscure beneath. From the account here given of the Hen-Harrier, it is quite clear that the change of plumage is effected in the

autumn of the year after it leaves the nest, and not in the same year."

A specimen in my collection, which was shot in October, and which retains a few brown feathers on the head, ruff, and wings, several of the coverts of the latter being spotted with light red, shews the second plumage of the male. The general colour is light bluish-grey; the scapulars and many of the feathers of the back dark greyish-brown toward the end, as are the extremities of the inner secondaries; the upper tail-coverts are pure white; the tail is light grey, with seven faint dusky-grey narrow bars, unless on the middle feathers. The blue of the lower parts gradually fades into white behind; the lower wing-coverts are white; but some of them are very faintly barred with grey, as are the axillary feathers and some of those of the sides, and the lower tail-coverts have a small roundish spot of the same near the end.

The females undergo little change as they advance in age, their dark brown parts merely acquiring a greyish tinge, the light red fading into greyish-yellow, and the bars on the wings and tail becoming narrower. The tail-feathers, quills, and larger coverts of the males, are covered with a velvety down, when new, and those of old females are so in a less degree; but the first plumage of both sexes has the surface bare and glossy.

Remarks.—I have carefully compared specimens of the American Marsh Hawk with several of our Hen-Harrier, and have not observed any difference of size, proportions, or colour, on which to found a specific distinction, in adult males, or in young males, or adult and young females. But in males passing into the adult state, there are markings such as I have not seen in European specimens, the feathers of the lower parts being white, with several spots of light red along their centre, these spots on the sides of the body and on the tibiæ assuming the appearance of transverse bars. If European individuals be found to present this character, I think there can be no reasonable doubt as to the specific identity of these birds, which moreover agree in their internal characters, at least in those

presented by the digestive organs. A bird from Northern India now before me, a male in the adult plumage, has faint bars of reddish spots on the sides and lower tail-coverts. The habits of the American bird, as described by Mr Audubon, are generally similar to those of ours, the differences being such as might arise from accidental circumstances. That celebrated ornithologist is convinced of the identity of the species, but several authors consider the American bird different from the European.

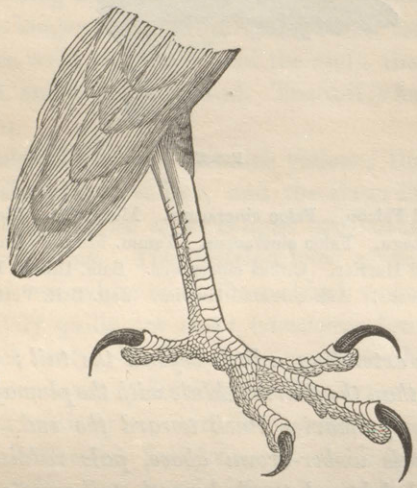


Fig. 232.

Mont.

2. CIRCUS CINERACEUS. MONTAGU'S HARRIER.

ASH-COLOURED HARRIER. ASH-COLOURED FALCON.

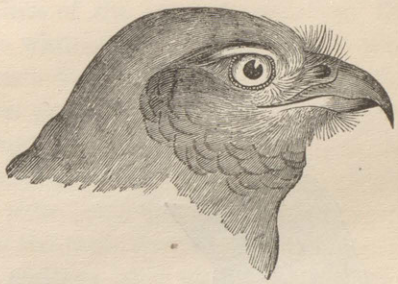


FIG. 233.

Ash-coloured Falcon. Falco cineraceus. Mont. Orn. Dict.
Busard Montagu. Falco cineraceus. Temm. Man. d'Orn.
Ash-coloured Harrier. Circus cineraceus. Selb. Illustr. I. 70.
Buteo cineraceus. Ash-coloured Harrier. Jen. Brit. Vert. An. 90.

The wings extending a little beyond the tail; the third quill much longer than the fourth. Male with the plumage light bluish-grey, the outer primaries black toward the end, the tail-coverts white. Female umber-brown above, pale reddish-yellow, with longitudinal bright red streaks beneath, tail-coverts white. Young similar to the female, but having the lower parts of a uniform bright red.

MALE.—This species, which was first clearly distinguished from the Common Harrier, and accurately described, by Montagu, is somewhat smaller and more slender than that species. The head is rather small, and ovate; the bill small and compressed; the upper mandible with its dorsal line sloping and somewhat convex on the cere, its sides slightly convex toward the end, its edges with a broad festoon, its tip slender and very

acute. The tarsi, which are long and slender, are feathered anteriorly about a fourth down, and are covered in front with about eighteen scutella, on the sides with reticular scales, behind with twelve scutella. The toes are small, similar to those of the common species, the first with eight, the second with ten, the third with eighteen, the fourth with fourteen scutella. The claws are of moderate length, well curved, slender, and finely pointed.

The plumage is very soft and blended, and the cervical ruff, although less apparent than in the common bird, is similarly formed. The wings are very long, rather narrow, rounded, and when closed extend a little beyond the tail; the third quill is longest, exceeding the second and fourth by nearly an inch, the first a little longer than the fifth; the outer four primaries with their inner webs sinuate toward the end; the secondaries broad, rounded, and slightly repand. The tail is long, straight, and nearly even.

The bill is black, the cere greenish yellow; the iris bright yellow, the tarsi and toes yellow, and the claws black. The general colour of the upper parts is light greyish-blue, the scapulars of a darker tint. The bristle-tipped plumelets of the loral spaces and cere white at the base, black toward the end. On the secondary quills are three transverse brownish-black bands, of which only the last appears when the wings are closed; the outer seven primaries are black toward the end, the first almost entirely so, and the seventh only tinged on the outer web. The tail is light grey, which fades outwards into white, and has four bands of a darker tint, becoming brownish-red on the outer feathers. The fore-neck and part of the breast are of the same bluish-grey as the back; the rest of the breast, the abdomen, and lower tail-coverts are white, each feather with a light red longitudinal band; the lower wing-coverts also white, with reddish bars.

Length to end of tail 17 inches, to end of wings $17\frac{1}{2}$; wing from flexure 15; tail $9\frac{1}{2}$; bill along the ridge 1; tarsus $2\frac{2}{12}$; first toe $\frac{1}{2}$, its claw $\frac{8}{12}$; second toe $\frac{7}{12}$, its claw $\frac{8\frac{1}{2}}{12}$; third toe $1\frac{2}{12}$, its claw $\frac{7}{12}$; fourth toe 1, its claw $\frac{5}{12}$.

Female.—The female, which is considerably larger than the male, has the bare parts coloured as in it, but the plumage very similarly to that of the female of the Common Harrier, from which however it may readily be distinguished by the bright red streaks on the lower parts. The general colour of the upper parts is dark umber-brown. The hind head and nape are brownish-red, with dark-brown streaks; some of the frontal feathers, a band above, and one below the eye whitish; the cheeks dark brown. The rump and upper tail-coverts are white, with brownish-red streaks. The quills are dark brown, as are the middle tail-feathers; but the rest have five bands of a lighter brown. The lower parts are light red, or reddish-orange, with longitudinal streaks of a deeper tint.

Length to end of tail 19 inches, to end of wings 20; wing from flexure $15\frac{1}{2}$; tail 10; bill along the ridge $1\frac{1}{12}$; tarsus $2\frac{4}{12}$; first toe $\frac{7}{12}$, its claw $\frac{9}{12}$; middle toe $1\frac{5}{12}$, its claw $\frac{7}{12}$.

Habits.—Montagu's Harrier has been found in most of the southern and eastern counties of England, but has not hitherto been observed beyond Northumberland. Its habits are said to be similar to those of the common species. Small birds and lizards have been found in its stomach. Its nest is placed on the ground, and it lays four or five bluish-white eggs, smaller than those of the Hen-Harrier. The young, which, according to Mr Jenyns, are hatched about the second week of June, are at first covered with white down. Besides the fact of its occurring on the continent from Poland southward, little more is known of its history. I have never seen it alive, and the specimens above described were merely skins.

Young.—Montagu has described a young male in its first plumage as follows:—"The bill dusky: cere yellow: irides so pale a yellow as to appear nearly white. The whole upper part of the head ferruginous, with small dusky spots; on the hind head, and nape, a broken patch of white; immediately above and beneath the eye is a pale streak; the coverts of the ears, extending down to the lower mandible, are dark chocolate brown: the quills the same; the first three or four pale ferru-

ginous about the middle of the inner web; the secondary quills the darkest, and all more or less tipped with ferruginous, except on the upper parts of the back; and those on the back of the neck are deeply margined with that colour: the lower part of the rump, and coverts of the tail, white, with a few streaks of bright ferruginous: the lesser coverts of the wings are deeply margined with ferruginous; the chin is dusky brown: the whole under parts, from chin to vent, including the thighs, under tail-coverts, and under coverts of the wings, bright ferruginous without spot, except the shafts, being somewhat darker, appearing on close inspection like fine slender streaks; the tail-feathers have five alternate darker, and five paler bars, but the upper ones are nearly obsolete; these bars on the outer feathers are bright ferruginous and white, with one bar near the end darker; the second is similar, but has the ferruginous bars inclining to chocolate-brown, and the white ones run into pale ferruginous on the outer webs; the three next become gradually darker, with the pale bars less conspicuous, and more ferruginous than white; the two middle feathers have the bars marked only by a shade of difference in colour, and are scarcely defined."

Linn.

3 CIRCUS ÆRUGINOSUS. THE MARSH HARRIER.

MOOR HARRIER. MOOR BUZZARD. HARPY. DUCK HAWK. KITE.



FIG. 234.

Falco æruginosus. Linn. Syst. Nat. I. 130.
Falco æruginosus. Lath. Ind. Orn. I. 25.
Falco rufus. Lath. Ind. Orn. I. 25.
Moor Buzzard. Mont. Orn. Dict.
Busard Harpaye ou de marais. Falco rufus. Temm. Man. d'Orn. I. 69.
Marsh Harrier. Circus rufus. Selb. Illustr. I. 66.

Adult umber-brown tinged with grey above, deep reddish-brown beneath, the head, part of the neck, and the shoulders, yellowish-white. In very old individuals, the primary quills and tail-feathers ash-grey. Young deep chocolate, the wing-coverts tipped with brownish-red, the quills and tail-feathers with reddish-white. After the first moult, more or less pale reddish or yellowish-white on the head and neck.

MALE.—The Marsh Harrier, although resembling the common species in form, differs from it in having the bill and feet stronger, and the ruff less conspicuous. These characters, together with its brown colour, give it somewhat of the appearance of a Buzzard. The body is ovate, very narrow behind,

the neck short, the head of moderate size, and oblong. The bill is short, about the same height and breadth at the base, compressed toward the end; the upper mandible with its dorsal outline sloping and nearly straight as far as the edge of the cere, then decurved in the fourth of a circle, its ridge broad and flattened on the cere, then convex, the sides rapidly declinate and slightly convex, the festoon rather prominent, the tip trigonal and acute; the lower mandible with the angle wide, the dorsal outline convex, the back broad and rounded, the sides convex, the edges inflected, the tip obliquely rounded.

The eyes are large; the eyelids feathered, and margined with ciliary bristles; the nostrils ovato-oblong, rather large, with a ridge from the upper edge; the aperture of the ear broadly elliptical and of large size. The tarsi are feathered anteriorly about a fourth of their length, rather slender, compressed, with eighteen anterior scutella, about ten scutella behind, and reticular scales on the sides. The toes are of moderate length, covered above with scutella, unless toward the base, there being five on the first toe, four on the second, fifteen on the third, and ten on the fourth; the fourth toe a little longer than the second, and connected with the third by a basal web. The claws are long, curved in about the fifth of a circle, tapering to a fine point; the first and second largest, the third with a thin edge.

The plumage is soft and blended, rather compact on the back and wings, somewhat glossy; the feathers ovate and rounded. The ruff, although formed as in the other species, is very inconspicuous. The loral spaces and sides of the cere are covered with bristle-tipped plumelets, which partially conceal the nostrils. The wings are long, broad, and much rounded; the primary quills strong, the outer four cut out on both webs; the fourth longest, the third only two twelfths of an inch shorter, the first and sixth about equal; the secondary quills thirteen, broad, and rounded. The tail is long, of considerable breadth, slightly rounded.

The bill is brownish-black, at the base tinged with yellow; the irides orange; the cere greenish-yellow; the tarsi and toes rich yellow, the claws brownish-black. The general colour of

the upper parts is deep umber-brown, of the lower deep reddish-brown. The upper part of the head and a large portion of the neck, including the throat, are white tinged with yellowish-brown; the bristles at the base of the bill black, the shafts of the feathers of the head brown. The smaller wing-coverts are of a paler brown, their tips brownish-white, and some of the scapulars have a broad yellow line along the middle of the outer web. The primary quills are blackish-brown, the rest of a lighter tint, all slightly margined with brownish-grey. The tail is light brown, tinged with grey, and tipped with brownish-white, the lateral feathers irregularly marked with brownish-red on their inner webs. The downy parts and bases of the feathers are grey, but on the head and neck pure white.

Length to end of tail 21½ inches; wing from flexure $16\frac{9}{12}$; tail 10; bill along the ridge $1\frac{5}{12}$, along the edge of lower mandible $1\frac{4}{12}$; tarsus $3\frac{3}{12}$; first toe $\frac{9}{12}$, its claw $1\frac{1}{12}$; second toe 1, its claw $1\frac{3}{12}$; third toe $1\frac{9}{12}$, its claw 1; fourth toe $1\frac{2}{12}$, its claw $\frac{9}{12}$.

Female.—The female, which is considerably larger, is similar to the male. An individual selected for description is as follows:—The upper parts are umber-brown, with the terminal margins of the feathers paler; the lower dark reddish-brown. The head, upper part of the hind-neck, the fore part of the loral space, and the throat are yellowish-white, with brown shaft-lines. The bristles about the base of the bill are black; the hind part of the loral space, a portion of the cheek, and the ear-coverts, brown. Some of the feathers on the middle of the neck behind, and on the fore part of the back, together with a patch on the wing near the scapulars, are yellowish-white, with brown shaft-lines. The primary quills are blackish-brown, with a tinge of reddish-purple; their inner webs at the base brownish-grey mottled with darker; the secondary quills chocolate-brown; all the quills slightly margined with brownish-grey. On the rump, the feathers are tipped with brownish-red. The tail-feathers are brown tinged with grey, tipped with reddish-white; the inner webs of most of them paler, and variegated with brownish-red. The lower parts are of a deep

chocolate-brown; but many of the feathers on the fore-neck and breast are yellowish-white, with brown central streaks.

Length to end of tail 24 inches, extent of wings 52; wing from flexure $16\frac{9}{12}$; tail $9\frac{9}{12}$; bill along the ridge $1\frac{5}{12}$; tarsus $3\frac{1}{2}$; first toe $\frac{10}{12}$, its claw $1\frac{2}{12}$; second toe 1, its claw $1\frac{2\frac{1}{2}}{12}$; third toe $1\frac{10}{12}$, its claw $\frac{11}{12}$; fourth toe $1\frac{1}{4}$, its claw $\frac{10}{12}$.

Variations.—Individuals coloured nearly as above, differ considerably in the extent of the yellowish or reddish-white on the head, neck, back, and wings, and in the tints of the tail and wings, which sometimes approach to grey. Very old birds have the secondary quills and tail ash-grey; but I have not seen a British specimen so coloured.

Habits.—In Scotland, the Marsh Harrier is of much less frequent occurrence than the Ring-tailed. I have once met with it in the Island of Harris, but it must be very rare in the northern and middle divisions. Dr Neill informs me that it frequents the rabbit-links of Gulan, in East Lothian, and that he once had an adult female which was caught there in a trap and preserved alive by Mr Yule of Luffness Mill, who sent it to him. None of the bird-stuffers in Edinburgh have had a specimen for at least five years back. It appears to be somewhat more numerous in the southern counties of Scotland, and is said to occur in most parts of England, being more frequently met with however in low and marshy tracts. According to Montagu, "it is the most common of the falcon tribe about the sandy flats on the coast of Caermarthenshire, where it preys upon young rabbits." He mentions his having once seen nine individuals feeding on the carcass of a sheep. Its food is said to consist of water-fowl, young ducks in particular, water-rats, frogs, lizards, fish, and insects. It flies low, skimming along in the manner of the common species, seldom pursues a bird in open flight, but pounces upon its prey when on the ground. "In the breeding season," as Montagu informs us, "when the female is sitting, the male will soar to a considerable height, and remain suspended on wing for a great length of time. The nest is most frequently made on the ground, amongst short

wood, furze, or fern, and is composed of sticks, rushes, or coarse grass. Sometimes, though rarely, it builds in the fork of a large tree." The eggs, he adds, "are perfectly white, without any spots, considerably less than those of the common buzzard."

Young.—When fully fledged, the young have the cere greenish-yellow, the bill yellow at the base, brownish-black toward the end; the iris deep brown; the feet yellow, the claws brownish-black. The general colour of the plumage is dark chocolate brown; the feathers of the upper parts slightly tipped with reddish-brown; the upper tail-coverts tinged with red; the larger wing-coverts largely tipped with pale brown.

Progress toward Maturity.—After the first moult, the upper part of the head and the nape are light brownish-red, the smaller wing-coverts are tipped with light red; the quills are darker than at first; but the general colour of the plumage is still deep chocolate. It appears that as the bird advances in age, the brown of the upper parts assumes a lighter tint, the tail becomes tinged with grey, its inner webs lighter, the primary quills, on the contrary, darker, and the white on the head and neck purer and more extended. In extreme old age, as M. Temminck alleges, or merely in maturity, as others say, the secondary quills and tail-feathers become light ash-grey; but this only in the male, which thus tends to approximate in colouring to the males of the other species. I have before me a specimen from India in this state; but I have not seen one killed in Britain that shewed more than a tinge of grey on the tail. The individual here alluded to has the upper parts chocolate brown, the head and hind-neck yellowish-red streaked with brown; the secondary quills ash-grey; the tail very pale ash-grey, fading almost into white on the lateral feathers; seven of the primary quills black; the throat and part of the fore-neck yellowish-red, the rest of the lower parts brownish-red. In its proportions it agrees with another specimen from the same country, which exhibits the ordinary state of plumage, the general colour being very dark chocolate; the head, neck, and throat yellowish-white; the cheeks and ear-coverts brown.

I think, therefore, there can be no reasonable doubt as to the identity of these grey-tailed individuals with the rest.

Remarks.—The Marsh Harrier, it thus appears, is dark coloured when young, and gradually becomes lighter as it advances in age. This, I think, is the general rule with respect to the falconine birds, although there are exceptions. The present species, as I have said, exhibits a considerable affinity to the Buzzards, and thus, in the eyes of those who prefer a circular arrangement, may with propriety be placed last in the series.

We have now examined all the British species of the family of Falconinæ, of several of which I have been enabled to give a pretty full account. Some of them, however, have not yet been well described; and therefore an account of their habits is a great desideratum, the supplying of which by any observers who have had opportunities of studying them, would be highly gratifying to me, which I cannot conceive to be of much importance to any other than a very benevolent person, and useful to science, which might induce even a very selfish one to communicate his observations.

Family III. STRIGINÆ. Strigine Birds.

~~OWLS~~.

The Common Barn Owl of Europe has generally been taken as the type of the great family of nocturnal rapacious birds, and it no doubt possesses in an eminent degree the faculties and peculiarities of organization which characterize the Owls, although many species exhibit them in equal perfection. It has also been made the type of the genus Strix, from which accordingly the name of the family is derived. The Wood Owl and the Long-eared Owl appear to me to have better claims to the chieftainship; but as it is clearly impossible to determine such a question, we may rest contented with an approximation to the truth.

Although the Harriers and Buzzards already described manifest a considerable affinity to some of the Owls, yet the Falconinæ are separated from the Striginæ by a wide interval, insomuch that an Owl can never be mistaken for a Hawk, by any person who has paid the least attention to birds. The Striginæ are distinguished by their extremely large feathered head, short and apparently very thick neck, moderately full body, long, broad, and rounded wings, short tail, full and peculiarly soft or downy plumage, feathered tarsi, versatile outer toe, and hooked bill and claws. But although they seem thus portly, their bulk is chiefly made up of feathers, for their body is in reality very small, extremely narrow behind, although of considerable breadth before, their neck slender and of moderate length. Their head however, whether viewed in its natural state or denuded, is larger than that of any other family of birds, although the brain is of very moderate dimensions.

The bill is always shorter than the head, furnished with a cere concealed by the feathers, generally stout, wide at the base,

compressed toward the end; the upper mandible with its dorsal line declinate and decurved, the sides more or less convex, the sharp edges destitute of a prominent lobe, the tip prolonged, tapering, and curved over the extremity of the lower mandible, which has the angle wide, the dorsal outline short and convex, the edges toward the end sharp, somewhat inflected, and decurved, with a shallow sinus on each side close to the rounded tip. The mouth is very wide; the palate flattened, sloping upwards at the sides, with two longitudinal papillate ridges, and an anterior median ridge. The posterior aperture of the nares is elliptical or oblong behind, linear before, with the margins generally papillate. The tongue is small, fleshy, narrow, sagittate and papillate at the base, channelled above, horny beneath, with the tip narrowed and emarginate or bifid. The œsophagus is very wide, of nearly equal calibre throughout, being destitute of the dilatation or crop observed in that of the Falconine and Vulturine birds. It is very thin, encircled by very slender muscular fibres, with its inner coat smooth, but, when the muscular is contracted, disposed into longitudinal plaits. The proventricular glandules are small, very numerous, cylindrical, and form a broad belt. The stomach is always large, roundish, somewhat compressed, with its muscular coat thin and composed of a single series of fasciculi, which are somewhat separated from each other, and converge toward two thin circular tendinous spaces; its inner coat or epithelium thin, soft or somewhat hard, generally smooth, sometimes rugous. The intestine is short, of considerable width or narrow, gradually diminishing to the commencement of the rectum; where there are two cœca, which are large, narrow at first, but dilating toward the end. The rectum, which is wide, has a very large globular dilatation or cloaca. These parts will be seen in Pl. V, which represents the digestive organs of the Snowy Owl, and in Pl. XXI, of which Figs. 5 and 6 represent those of the Eagle Owl.

The trachea, Pl. XIX, Fig. 9, is generally short, wide, with numerous slender and unossified rings, and a single pair of inferior laryngeal muscles. The figure referred to represents the windpipe of the Snowy Owl of the natural size:—*a*, the

tongue; *b*, its basal portion; *c c*, part of the hyoid bones; *d e*, the trachea, flattened, somewhat wider above, composed of ninety rings, of which one at the bifurcation is similar to that of the Hawks, Fig. 3. The bronchi, *g h*, *g h*, are wide, very short, composed of about fourteen half-rings. The lateral muscles, *i j*, *i j*, are rather slender, and terminate partly, as usual, in the sterno-tracheales, *j k*, *j k*, and partly in a single pair of inferior laryngeal muscles, *j f*, *j f*, inserted into the first bronchial ring.

The eyes are always extremely large, fixed in the orbits, or having very little motion, directed obliquely forwards, so that an object may be perceived by both at once, although, as their axes are never parallel, they cannot both be directed to the same point. The upper eyelid is very large, and both are ciliated with barbed plumelets, and have a broad, thin, bare margin. Nostrils rather large, or of moderate size, round, oval, or elliptical, and placed near the anterior margin of the cere, but generally concealed by bristles. The aperture of the ear is never small, generally very large, often of extreme size, and frequently furnished with an operculum or lid.

The legs are of moderate length, or short; the tibia muscular; the tarsus covered with feathers, which however are sometimes

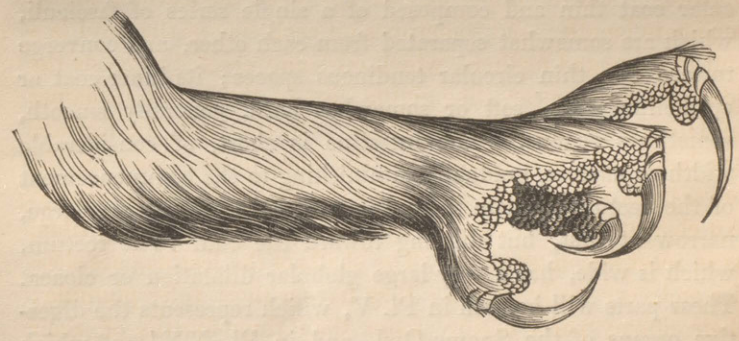


Fig. 235.

destitute of filaments, and being thus reduced to the shafts, resemble hairs. The toes are also feathered, but in many species the feathers upon them are reduced to the shafts. In a few Asiatic species, both tarsi and toes are bare, and covered

with small prominent scales. The first toe is shortest, and admits of much lateral motion; the fourth or outer is next in length, and capable of being turned backwards, so that when the bird is perched, the first and fourth toes are opposed to the second and third. The toes have two or three scutella at the end, and are padded and papillate beneath. The claws are long, well curved, tapering, very narrow beneath, and extremely acute.

The plumage is remarkable for its mass, and the softness of its texture. On the sides of the head are slender radiating feathers, having loose and more or less bristly filaments, and forming two circular disks or masks, which are sometimes complete, but often deficient above the eye, in which case the feathers there are of ordinary texture. Another remarkable feature is formed by a kind of ruff, formed of narrow recurved feathers, arranged in several series. It sometimes extends on each side from the anterior part of the forehead, round the disk and behind the ear, to the chin, or angle of the lower mandible, and is then said to be complete; but sometimes it occupies only a portion of the posterior margin of the disk. The larger the ear the more extended the ruff, so that in those species which have the external auditory organ small, the ruff is scarcely apparent. On the upper part of the head the feathers are of moderate length; and sometimes on each side of the head is a tuft of elongated feathers, which on being erected suggests the idea of a horn or ear, thus giving rise to the erroneous names of Horned Owls and Eared Owls. On the neck the feathers are long, soft, and elastic; on the body ovate, those on the lower parts of looser texture, and on the abdomen entirely downy. An elongated tuft is seen on the femur, but never on the tibia, as in most falconine birds. The shafts of the feathers are slender and very easily broken; they have a short tufty plumule; their downy parts occupy more than three-fourths of their extent; and frequently their surface is villous or tomentose, being covered with delicate barbicels, which are generally more apparent on the quills. Numerous very slender hairs, terminated by a few filaments, are interspersed among the plumage. The wings are always broad, generally long, and more or less rounded; the primary quills ten, the secondary thirteen or fif-

teen ; the filaments of the outer web of the outermost quill usually separated at the end and recurved. The tail, always of twelve more or less arched feathers, varies in length, but is generally short and even, or slightly rounded.

The cranium is always short, of extreme breadth behind, somewhat triangular, and of very large size ; but its bulk is in a great measure produced by the separation of its two tables by the intervention of numerous cells. The orbits are excessively large, and separated by a bony septum, which is generally complete, sometimes thickened, and in the genus Strix more than a quarter of an inch in breadth, and cellular. The superciliary bone is not present as in the Falconinæ, or exists merely in a rudimentary state, and is never distinct. The nasal cavity is

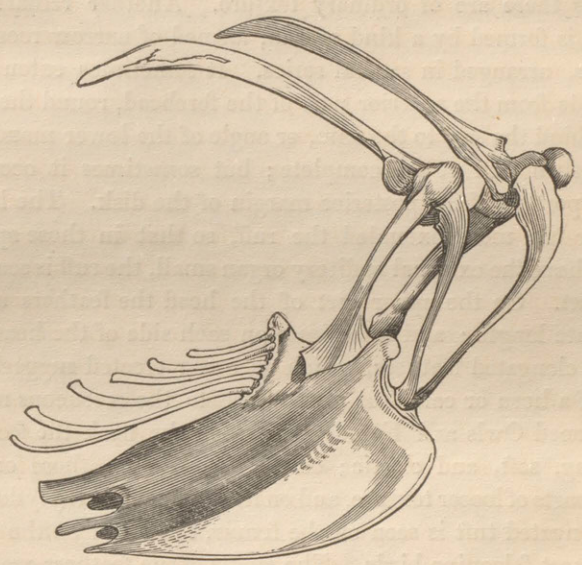


Fig. 236.

rather large ; that of the ear extremely so ; but not in proportion to the external parts. The vertebræ vary in number ; but there are generally twelve cervical, eight or nine dorsal, twelve sacral, and eight caudal ; of which the last is usually not half the size of that of the falconine birds. The ribs, seven in number, are very slender. The sternum is very short, small when compared with those of the Hawks or Vultures,

with the sides nearly parallel, the ridge or keel very prominent, and well advanced, the posterior margin with four notches. The coracoid bones are long, considerably flattened, moderately spreading; the furcula very slender, of the form of the letter V, never so wide as in the Hawks; the scapulæ very long, narrow, and nearly straight. The bones of the wing are of moderate length. The pelvis is rather large; the femur short, the patella distinct, the tibia rather long, the fibula, which is slender, partially united to it; the tarsus generally short, never long; the phalanges of the toes two, three, four, and five.

Owls in general are of nocturnal habits. Their enormous eyes, of which the iris is most delicately sensitive, enable them to perceive an object in the dim twilight, or even amidst the gloom of night; and the extreme development of the external aperture of the ear, with its marginal fringes, is calculated to collect and concentrate the faintest undulations of sound. It is generally believed that the eyes of Owls shine in the dark, but I have failed to discover any such reflection of light from them, although I have examined those of two species with reference to this subject. They prey on small quadrupeds, birds, and insects, especially nocturnal lepidoptera and large beetles. Some species also prey occasionally on fishes. They kill their prey by pouncing upon it, and thrusting their talons into it. If large, they carry it off in their claws, but if small, transfer it to the bill. Small birds and mice are usually swallowed entire; large animals are plucked and torn into morsels; and the indigestible parts being subsequently collected into pellets in the stomach, are disgorged. Many owls and hawks feed on precisely the same animals,—the Barn Owl and the Hen Harrier for example. Why the Hawks should have a very large œsophageal dilatation, and minute or obsolete cœca, while the Owls have the œsophagus of uniform width, and the cœca large, is by no means obvious. Fanciful explanations are easily made, and as easily refuted. The only hawk known to me which has no crop is Nauclerus furcatus, described at p. 277; yet there is nothing peculiarly strigine in its form or manners.

In accordance with the nocturnal habits of the Owls, a pecu-

liarly noiseless and buoyant flight was necessary, to enable them to steal unawares upon a timid and vigilant, and hover with ease while searching for a concealed or lurking prey. They fly in an apparently unsteady or wavering manner, and so gentle is the motion of their downy wings, that one is not by hearing rendered sensible of their immediate presence. Some species however have a more direct, vigorous, and hawk-like flight. When alighted on a flat surface, they bring forward the outer toe, and incline the body considerably, so as not to injure the tail; but when perched on a narrow space, they stand nearly erect, and reverse the outer toe. By day they repose on rocks, or other elevated objects, or in the hollows of trees, in recesses of buildings, or cavities of rocks, some species however on the ground. The form of their feet, and especially the elongation and curvature of their finely pointed claws, incapacitate them from walking, so that in moving from one place to another they advance by awkward leaps. They are solitary, or live in pairs, their kind of food rendering associations injurious. Their peculiar physiognomy gives them an appearance of grotesque gravity, which men have mistaken for wisdom; while their nocturnal habits, and retired and often gloomy haunts, together with their harsh or uncouth cries, have wrought upon the imagination until the Owl has become associated with calamity, desolation, and death. Owls however are generally very harmless, and often very beneficent creatures. Such of them as are truly nocturnal, seem bewildered and blinded when accidentally abroad by day, and are liable to be insulted and buffeted by other birds. When surprised or irritated, Owls hiss in the manner of the domestic cat, and click their bills. Some species have a harsh shrieking cry, and others emit various sounds, not always disagreeable, which are denoted by the term *hooting*.

They nestle in the hollows of trees, in crevices of rocks, in dark corners in buildings, on lofts in outhouses, in dove-cots, and sometimes on the ground. The nest is rudely constructed of twigs and grass; or sometimes there is none at all; or the deserted nest of another bird is adopted. The eggs are generally roundish, or broadly elliptical, but sometimes oval, always

white, and vary from two to five. The young, which are at first covered with greyish, brownish, or whitish down, remain long in the nest, and after going abroad are aided for some days by their parents. When fledged, they generally differ very little in colour from the old birds; the older the individual is, the more simple is its colouring, the dark markings gradually diminishing in extent, and the tints becoming lighter.

The moult, which is very gradual, commences in summer, and is completed by the end of autumn. The plumage, owing to its delicate texture and great elasticity, suffers little from friction, and its colours are generally little acted on by the weather. The males are always smaller than the females; but the sexes seldom differ in colour.

Some species are in a great measure diurnal, and in aspect as well as manners approach the Falconine birds. They have the plumage somewhat more compact, and the aperture of the ear smaller. The form of their cranium also is very similar to that of the diurnal Raptores. The larger the conch of the ear, and the more downy the plumage, the more strictly nocturnal are the habits. Hence, in arranging the Owls into genera, it is of importance to attend particularly to the organ of hearing.

Various arrangements, exhibiting various degrees of ingenuity, have been proposed. All that I have seen are very defective; and I have not yet acquired sufficient knowledge of the subject to frame a satisfactory classification, having dissected only about fifteen species, and examined the skins of about double that number. I shall therefore discard criticism on the present occasion, relinquish the hope of excelling my predecessors, and confine my efforts to the construction of such an arrangement of the British Owls as may enable the student readily to distinguish their species and genera. Let us in the first place attend to the ear.

In birds generally, and in the Peregrine Falcon in particular, taking it merely as a convenient example, the external ear, Fig. 237, *a*, is of a roundish form, and of moderate size. It presents a circular thickened margin of skin, a little raised above the surrounding parts, and having its outer edge beset with slender feathers, of which the anterior are recurved, much longer

than the rest, and capable of covering the aperture. Within this rim is an irregular cavity, having at its lower part a transverse oblong aperture, the commencement of the passage that leads to the membrane of the tympanum, on which the impulses of the air impinge. In man and the mammalia this passage, the meatus auditorius externus, is of considerable length, but in birds extremely short, sometimes not more than a twelfth of an inch.

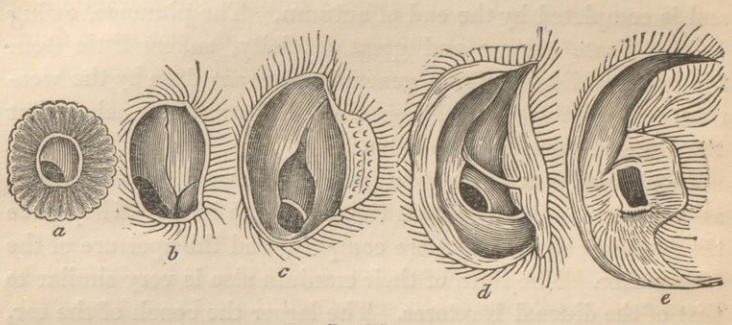


Fig. 237.

Now, in some Owls, for example the Snowy Owl and the Hawk Owl, Strix nyctea of Linnæus, and Strix funerea of Gmelin, the external ear differs from that of Hawks only in being proportionally much larger. In these birds, it is of an elliptical form, Fig. 237, *b*, and its greatest diameter is not more than from a third to a half of the height of the skull. In the Eagle Owl, Strix Bubo of Linnæus, the external ear is about half the height of the skull, being an inch or a little more in length, and nearly of the same form as in the Snowy Owl. In both cases, it has the margins little elevated, and beset with slender feathers. In several Asiatic species which I have examined, otherwise allied to the Eagle Owl, I have found the aperture of the ear proportionally much smaller. In our common Tawny Owl, Strix Aluco, it is of medium size, for that of an owl, although in fact very large, Fig. 237, *c*, being more than half the height of the skull, and has moreover an elevated anterior semicircular flap or lid. Such an ear, having its margins elevated in whole or in part, bears some resemblance to the human external ear, which having by anatomists been likened to a shell,

is named the conch. In the large-eared Owls then, the external ear also is called a conch. In our "Long-eared" Owl, Strix Otus, so called on account of its ear-like tufts of feathers, the conch is higher than the skull, Fig. 237, *d*, for it extends in a semicircular direction from the base of the lower mandible to above the middle of the eye, and has anteriorly in its whole length an elevated opercular margin. Lastly, in the Barn Owl, Strix flammea, the conch is as long as in the last-mentioned species, but is thinly covered with feathers, and has not distinctly elevated margins, but is furnished with an anterior operculum, not extending along more than half its length, Fig. 237, *e*.

Were generic characters to be derived solely from the conch, we should have only four genera of Owls: those with a moderately large simple aperture, *b*; the head tuftless or tufted, the tarsi feathered or bare, very short or rather long, the tail very short, short, or longish; those with a large aperture, having an anterior operculum in part of its length, *c*; those with an excessively developed conch, of which the margins are elevated in their whole length, *d*; and lastly, those having an equally elongated conch, without elevated margins, but with an operculum, *e*. These genera, being thus well characterized, might perhaps suffice; but as in other groups we take our characters from the bill, wings, and feet, it may with justice be said that we ought to treat the Owls in the same manner.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. SYRNIA. DAY-OWL.

Bill very short, strong, with the upper outline decurved from the base; nostrils ovate or elliptical, rather large, oblique; conch elliptical, simple, or without operculum, its greatest diameter not more than half the height of the skull; facial disks incomplete above the eyes; ruff incomplete and inconspicuous; head very large, roundish; tarsi very short, feathered; wings very large, the third quill longest,

the first with the outer filaments thickened but scarcely recurved at the end.

1. *Syrnia funerea. Hawk Day-Owl.* Tail long, much rounded; upper parts brownish-black, spotted with white, lower parts barred with brown and white.

2. *Syrnia nyctea. Snowy Day-Owl.* White, with dark brown spots on the upper parts, and bars beneath; toes covered with loose-edged shaggy feathers. Young with the dark markings larger.

3. *Syrnia ~~pilodactyla~~ nudipes. Bare-toed Day-Owl.* Upper parts wood-brown, spotted with white, lower yellowish-white with longitudinal brown spots; toes covered with bristles, between which the scales are apparent.

GENUS II. SCOPS. OWLET.

Bill short, strong, with the upper outline decurved from the base; nostrils roundish, large; conch elliptical, simple, having only a slightly elevated fringed margin, its length about a third of the height of the head; facial disks incomplete above the eyes; ruff inconspicuous and incomplete; head very large, roundish, with two elongated tufts; tarsi of moderate length, slender, covered with short feathers or half-bare; wings long, rounded, with the third quill longest.

1. *Scops Aldrovandi. Aldrovandine Owlet.* Tufts of about twelve feathers; upper parts variegated with grey and brown, and streaked with brownish-black; lower pale grey.

GENUS III. BUBO. EAGLE-OWL.

Bill short, deep, convex, with the upper outline decurved from the base; nostrils roundish or broadly elliptical; conch elliptical, simple, fringed, without operculum, its length from a third to half the height of the skull; facial disks incomplete above the eyes; ruff inconspicuous and incomplete; head very large, roundish, with two elongated tufts; tarsi very short, strong, densely feathered, as are the toes; wings with the first quill short, the fourth longest.

1. *Bubo maximus. Great Eagle-Owl.* Tufts of about eighteen feathers, projecting more than two inches; upper parts variegated with dark brown and light reddish-yellow; lower parts of the latter colour, with longitudinal blackish-brown spots and streaks, and numerous transverse undulating lines.

GENUS IV. ULULA. HOOTING-OWL.

Bill short, strong, with its upper outline decurved from the base; nostrils large, elliptical or roundish; conch more than half the height of the head, extending from the level of the upper part of the eye to the base of the lower jaw, fringed, and having anteriorly an elevated semicircular, stiff, operculum, beset with slender feathers; facial disks very large and complete; ruff conspicuous and complete; head extremely large, and round; tarsi very short, and with the toes densely feathered; wings much rounded, with the fourth quill longest, the first about the length of the tenth.

1. *Ulula Aluco. Tawny Hooting-Owl.* Greyish-brown, mottled and longitudinally streaked with dark brown. Young birds brownish-red, similarly marked. In all, large white spots on the wings.

2. *Ulula Tengmalmi. Tengmalm's Hooting-Owl.* Upper parts liver-brown spotted with white, lower yellowish-white with longitudinal brown markings; tarsi and toes with long soft downy feathers, which distinguish it from Syrnia psilodactyla.

Otus. Hibou.

GENUS V. ~~ASIO~~. ~~TUFTED OWL~~.

Bill short, of moderate strength, with its upper outline slightly decurved from the base; nostrils large, oblong, oblique; conch of extreme size, extending from over the middle of the eye to the base of the lower mandible, of a semilunar subelliptical form, having anteriorly in its whole length an operculum stiffened with long narrow feathers, and posteriorly a broad membranous fringed membrane; facial disks very large and complete; ruff conspicuous and complete; head very large, subtrigonal, with two small tufts; tarsi short and with the toes

densely feathered; wings with the first quill about the length of the fourth, the second longest.

1. *Asio Otus. Mottled Tufted-Owl.* Tufts of about twelve feathers, projecting about an inch; upper parts light reddish-yellow, spotted and undulated with brown and greyish-white; lower parts buff-coloured, less spotted; the eye half-encircled with dark brown.

2. *Asio Brachyotus. Streaked Tufted-Owl.* Tufts of three feathers, projecting about half an inch; upper parts light reddish-yellow, broadly streaked and barred with brown; lower parts with narrow brown streaks; the eye surrounded with brownish black; many of the scapulars and wing-coverts with a large white spot at the end; the light bands on the middle tail-feathers with a brown central patch.

GENUS VI. STRIX. SCREECH-OWL.

Bill rather short, compressed, with the upper outline straight to the end of the cere, then decurved; nostrils subovate; conch of extreme length, semicircular, extending from over the anterior angle of the eye to the middle of the lower jaw, beset with filaments, margined with slender feathers, and having a short truncate operculum stiffened with small feathers; aperture of meatus square; facial disks very large and complete; ruff conspicuous and complete; head extremely large, somewhat triangular; but the skull not larger than in the last genus, and more elongated; tarsi rather long, covered with short soft feathers; toes scaly and bristled; claw of the third toe with its thin edge serrate.

1. *Strix flammea. European Screech-Owl.* Operculum with the feathers complete (they being in the American species reduced to the tube); upper parts light reddish-yellow, variegated with ash-grey, and dotted with black and white; lower parts white, with small dusky spots.

Genus I. SYRNIA. DAY-OWL.

Commencing the series of Owls with those which in their structure and habits seem to approach nearest to the Falcons and Hawks, we find the Snowy Owl, in the comparative smallness of its auricular conch, general form, and diurnal habits, the first in order of our British species. The Hawk-Owl, and several other species, agree with it in presenting the following generic characters.

Bill short, strong, compressed toward the end: upper mandible with the cere short, the dorsal outline decurved from the base, the ridge broad and convex, the sides convex toward the end, the tip trigonal, acute, decurved so as to be nearly perpendicular; lower mandible straight, with the crura short, the angle wide and rounded, the dorsal line short and convex, the edges toward the end sharp, inflected, and decurved, with a shallow sinus on each side close to the rounded tip.

Mouth very wide; palate flat, sloping a little upwards at the sides, with two longitudinal ridges, and entirely covered with minute papillæ; a prominent ridge toward the mandible. Posterior aperture of the nares broadly elliptical, with an anterior slit. Tongue short, deeply sagittate and papillate at the base, nearly flat above with a median groove, its sides nearly parallel, the tip narrowed, rounded, and slightly emarginate. Œsophagus wide, without dilatation. Stomach large, roundish; its muscular coat very thin, being composed of a single series of fasciculi; the epithelium thick, moderately tough, and rugous. Pylorus very small, with two prominences; intestine of moderate length, rather wide; cœca large, oblong, narrowed at the base; cloacal dilatation globular and very large.

Nostrils ovate, oblique, in the fore part of the cere, which is generally tumid behind them. Eyes very large; eyelids with broad thin crenate margins, but without distinct ciliæ. Conch

of the ear simple, elliptical, very large, although comparatively small, being less than half the height of the head, its slightly elevated margin fringed with linear feathers.

Head very large, broad, rounded, anteriorly narrowed; neck short; body of moderate size, much narrowed behind. Legs rather short, stout; tibia of moderate length; tarsus short, feathered; toes short, covered with feathers of which the filaments are hair-like, but in some species wanting, the shafts alone remaining; all with two scutella at the end, padded and with flattened papillæ beneath; the first very short, with much lateral motion; the fourth longer, and reversible; the third longest, but not much exceeding the second. Claws long, well curved, tapering, very acute, compressed, rounded above, slightly convex on the sides, narrow beneath; the third with a dilated inner edge.

Plumage very full and soft, somewhat compact above, blended beneath. Facial disks incomplete above the eyes, their feathers with loose filaments; the anterior longer, more bristly, and partially concealing the bill. Ruff incomplete and inconspicuous. Feathers in general oblong, rounded; those of the abdomen downy, of the legs with soft disunited filaments. Wings large, broad, rounded; primary quills broad and rounded; the first four sinuate on both webs, more deeply on the inner; secondary quills fifteen, broad and rounded. Tail broad, rounded, of twelve slightly arched, rounded feathers.

The largest species of this genus, Syrnia nyctea, has the appearance of a very robust bird, although, as usual in this family, the greater part of its bulk is made up of feathers. The Hawk-Owl, Strix funerea of Linnæus, is of a more elongated form, but belongs to the same genus. The Little or Passerine Owl, Strix passerina of some, and S. nudipes of others, seems to me to approximate so nearly in the form and size of the ear, and in other respects, although its tarsi are longer, and its toes less feathered, that I think there is little reason for instituting a new genus for its reception. Strix cunicularia, which has much longer tarsi, forms the ultimate gradation; and yet it does not differ more from Strix funerea, than the Sparrow Hawk from the Goshawk. Those who unite the

Rough-legged and the Bare-legged Buzzards into one genus, cannot consistently separate Strix cunicularia from Strix nyctea, on the ground of some difference in the feathering of the tarsi and toes.

The birds of this genus inhabit open districts in preference to such as are densely wooded. They are for the most part confined to the arctic regions during the warmer season, and at the approach of winter advance a little southward. Being adapted for a residence in regions where for a great part of the year there is no night, they are enabled to discover and pursue their prey during the day; in which respect they differ from most other Owls. Their food consists of quadrupeds, birds, fishes, and insects. They nestle in rocks, on trees, or on the ground. Of the two species which have been met with in Britain, neither is permanently resident. Another has been procured at some distance from the coast.

The accompanying figure shews the conch of the Snowy Owl, of the natural size. The shafts only of its marginal feathers have been represented.

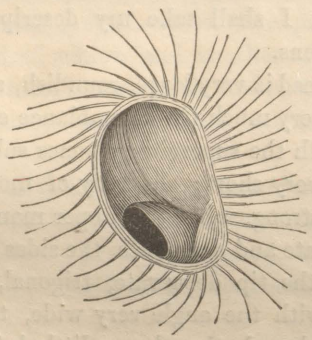


Fig. 238.

2. SURNIA FUNEREA. THE HAWK DAY-OWL.

HAWK-OWL. HUDSON'S BAY OWL.

Strix canadensis. Briss. Ornith. I. 518.
Strix funerea. Gmel. Syst. Nat. I. 294.
Strix hudsonia. Gmel. Syst. Nat. I. 295.
Chouette Caparacoch. Strix funerea. Temm. Man. d'Orn. I. 86.

Tail rather long and much rounded; toes covered with shaggy feathers. Upper parts brownish-black, spotted and barred with white; lower parts white, narrowly barred with dusky.

This Owl, which in form makes a considerable approximation to a Falcon, having been met with only once, and that not in any part of Britain, but on the coast, has truly very little claim upon our recognition. That individual not being accessible to me, I shall take my description from North American specimens.

Male.—The head is very large, roundish, and convex above, the skull having very much the resemblance of that of a Falcon or Hawk, but with the superciliary bones subulate and anchylosed; the neck very short; the body of moderate size. The bill is short and strong, with the upper mandible having the dorsal line declinate and decurvate, the sides convex, the edges nearly straight, the tip decurvate, trigonal, and acute; the lower mandible with the angle very wide, the dorsal outline convex, the ridge broad, the edges a little inflected toward the end, the tip obtuse. Nostrils roundish; eyes very large; aperture of ear broadly elliptical, five twelfths of an inch in length, and simple. Legs very short, robust; tarsus very short, and, with the toes, feathered; claws long, compressed, well curved, finely pointed, the third with a dilated thin edge.

Plumage full, very soft, and blended. Cere covered with slender stiffish reversed feathers; facial disks incomplete above.

Wings rather long, rounded ; the first quill intermediate between the fifth and sixth, the third longest, the fourth scarcely two twelfths shorter ; the outer four having the outer web attenuated ; the first in the greater part of its length, and the second toward the end, with the filaments thickened, and a little separated. Tail rather long, much rounded, the lateral being two inches shorter than the middle feathers.

The bill is pale yellow or yellowish-white, the claws dusky, the iris pure yellow. The facial disk greyish-white, anteriorly mixed with black filaments. The upper part of the head and the hind-neck are brownish-black, the former with numerous roundish white spots, of which there are three on each feather, the latter with two broad longitudinal bands of white spots ; the facial disk margined behind with blackish-brown. The upper parts are chocolate-brown, with white spots, which are larger on the scapulars, and disposed in bars on the rump and upper tail-coverts. Both webs of the quills, excepting the outer of the first and second, and the inner of the last five, marked with transverse elliptical white spots. Tail with about eight bands of narrow oblong white spots ; the quills and tail-feathers tipped with white. Throat greyish-white, fore part of neck with a semicircular band of white, and another of brownish-black ; the lower parts white, barred with dusky, the bars on the abdomen and feet fainter, and on the lower tail-coverts greyish-brown.

Length to end of tail 15 inches, to end of wings 12 ; wing from flexure $9\frac{3}{4}$; tail $7\frac{1}{2}$; bill along the ridge $1\frac{5}{12}$; tarsus 1 ; first toe $\frac{5}{12}$, its claw $\frac{10}{12}$; second toe $\frac{8\frac{1}{2}}{12}$, its claw $\frac{11}{12}$; third toe $\frac{10}{12}$, its claw $\frac{10}{12}$; fourth toe $\frac{6}{12}$, its claw $\frac{10}{12}$.

Female.—The female, which is considerably larger, resembles the male, but has the ground colour of the upper parts of a lighter tint, and the white markings smaller.

Length to end of tail 17 inches ; bill along the ridge $1\frac{5}{12}$; wing from flexure 10 ; tail 8 ; tarsus $1\frac{1}{12}$; first toe $\frac{5}{12}$, its claw $\frac{10}{12}$; third toe $\frac{11}{12}$, its claw $\frac{10}{12}$.

Habits.—This bird inhabits the northern parts of both con-

tinents, advancing little southward in winter. Dr Richardson says, " it is a common species throughout the fur countries from Hudson's Bay to the Pacific, and is more frequently killed than any other by the hunters,—which may be partly attributed to its boldness and its habit of flying about by day. In the summer season it feeds principally on mice and insects; but in the snow-clad regions which it frequents in the winter, neither of these are to be procured, and it then preys mostly on Ptarmigan. It is a constant attendant on the flocks of Ptarmigan in their spring migrations to the northward. It builds its nest on a tree, of sticks, grass, and feathers, and lays two white eggs. When the hunters are shooting grouse, this bird is occasionally attracted by the report of the gun, and is often bold enough, on a bird being killed, to pounce down upon it, though it may be unable from its size to carry it off."

M. Temminck states that it sometimes appears as a bird of passage in Germany, and more rarely in France, but never in the southern provinces. Whether the solitary individual met with off the southern coast of England, came from America or the European continent, or was a tame bird that had escaped, can only be conjectured. It was captured, in March 1830, in an exhausted state, on board a collier ; and an account of this occurrence was presented to the Zoological Society, in 1835, by Mr Thompson of Belfast.

Remarks.—My account of the digestive organs of a male of this species, with figures, will be seen in the fourth volume of Mr Audubon's Ornithological Biography. They differ in no essential respect from those of the other owls; the œsophagus four inches and three-fourths in length, and from ten to eleven twelfths in width ; the stomach an inch and five twelfths long, an inch and a twelfth and a half in breadth, its epithelium very soft and rugous ; the intestine eighteen inches long, from four twelfths to a twelfth and a half in width ; the rectum two inches long ; the cœca two inches and a quarter in length ; and the globular cloaca ten twelfths in diameter.

SYRNIA NYCTEA. THE SNOWY DAY-OWL.

SNOWY OWL. HARFANG.

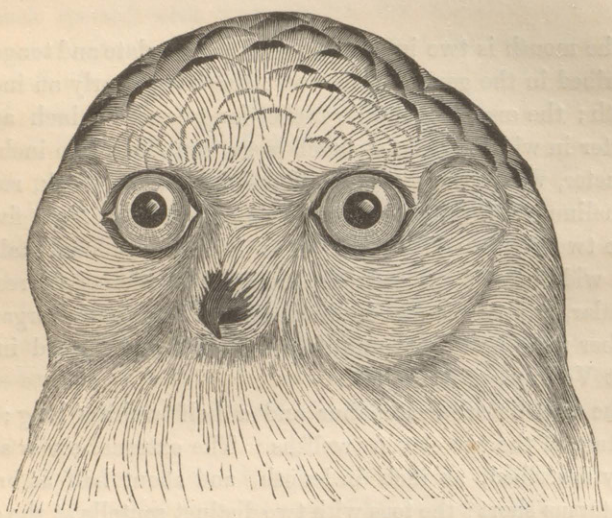


FIG. 239.

Strix nyctea. Linn. Syst. Nat. I. 132.
Strix nyctea. Lath. Ind. Orn. I. 57.
Snowy Owl. Mont. Orn. Dict. Suppl.
Chouette Harfang. Strix nyctea. Temm. Man. d'Orn. I. 82.
Snowy Owl. Syrnia Nyctea. Selb. Illustr. I. 95.
Noctua nyctea. Snowy Owl. Jen. Brit. Vert. An. 93.

Tail rather long, moderately rounded; plumage white, the head and back spotted, the wings, tail, and lower parts barred with dusky brown. Young with larger markings.

MALE.—Excepting the Eagle-Owl, this is the largest species met with in Britain, where however it is of very rare occurrence, and has not been found breeding. It is more robust than any other species of its genus, with a very large round

head, six inches in breadth including the feathers, short neck, and strong feet. The bill is stout, with the outline of the upper mandible curved from the base, its ridge broad, but toward the end narrowed, the sides very convex beyond the cere, the tip acute and decurved ; the lower mandible with the angle wide, the dorsal line convex, the sides rounded, the edges inflected, with a shallow notch on each side, close to the rounded tip.

The mouth is two inches in width ; the palate and tongue as described in the generic character ; the latter nearly an inch in length ; the œsophagus nine inches long, and an inch and a quarter in width. The stomach large, roundish, two inches in diameter, with a very thin muscular coat, and a thick, rugous epithelium ; the intestine forty-two inches long, from five to three twelfths in width ; the cœca five inches long, half an inch wide toward the end ; the cloacal dilatation of the rectum globular, and two inches in diameter. The digestive organs of another male have been minutely described and figured in the First Volume, p. 61, Pl. V.

The nostrils are ovate, four and a half twelfths long ; the aperture of the eye eleven twelfths. The external ear is as already described, an inch in length, and about half as broad. The tarsus short ; the toes with two distinct scutella at the end ; the claws long, well curved, slender, tapering to a fine point ; the first and fourth rounded beneath, the second flattened, the third convex, but with an inner sharp edge.

On the face the feathers are long and slender, with disunited filaments, and the bill is nearly concealed by them. The facial disks are incomplete, not extending above the eye, the feathers there being short ; and the ruff occupies only a small space on each side. On the upper parts, the feathers are broad, rounded, and somewhat compact ; on the lower ovato-oblong and softer. The wings are long, broad, rounded ; the primary quills broad and rounded ; the outer four deeply sinuate on the inner web, and slightly narrowed on the outer ; the first shorter than the fifth, an inch and a half shorter than the second, and having the tips of its outer filaments free and recurved ; the third longest, being a quarter of an inch longer than the second, and two-

twelfths longer than the fourth; the secondary quills broad and rounded. The tail is rather long, moderately rounded, and exceeds the closed wings about an inch and a half.

The bill and claws are black; the inside of the mouth deep flesh-colour, the tongue paler, the iris pure yellow, the thin edges of the eyelids blackish-brown. The general colour of the plumage is pure white; the upper part of the head, and the back spotted with dark brown, the scapulars and wing-coverts having two transverse spots toward the end; the quills and tail-feathers are banded, and the breast and sides narrowly barred, with the same. To speak more particularly:—The forehead, fore-neck, part of the breast, lower wing-coverts, abdomen, and lower tail-coverts are white. The rest of the lower parts are transversely barred with blackish-brown, the bars varying in breadth from one to two twelfths, and placed at intervals of about half an inch. The feathers on the upper part of the head are tipped with brown, on part of the hind-neck without markings; the rest of the upper parts banded; the quills banded on both webs, as are the tail-feathers, except the outer, the rest having toward the end a number varying from one to four.

Length to end of tail 23 inches, to end of wings $21\frac{1}{2}$; extent of wings 56; wing from flexure $17\frac{1}{4}$; tail $9\frac{1}{2}$; bill along the ridge $1\frac{9}{12}$, along the edge of lower mandible 2; tarsus $2\frac{2}{12}$; first toe $\frac{5}{12}$, its claw $1\frac{4}{12}$; second toe $1\frac{6}{12}$, its claw $1\frac{8}{12}$; third toe $1\frac{7}{12}$, its claw $1\frac{8}{12}$; fourth toe $\frac{7}{12}$, its claw $1\frac{5}{12}$.

Female.—The female greatly exceeds the male, but in colour differs only in having the dark markings larger.

Length to end of tail 26 inches, to end of wings 24; extent of wings 65; wing from flexure 18; tail $9\frac{3}{4}$; bill along the ridge 2; tarsus $2\frac{1}{2}$; first toe $\frac{5}{12}$, its claw $1\frac{4}{12}$; second toe $1\frac{5}{12}$, its claw $1\frac{4}{12}$; third toe $1\frac{6}{12}$, its claw $1\frac{7}{12}$; fourth toe $\frac{9}{12}$, its claw $1\frac{5}{12}$.

Variations.—Some individuals are almost entirely white, the spots on the head and back being very small, and those on the wings and tail almost obliterated. Others have the mark-

ings large, and the bars on the lower parts distinct. But I am not aware of any other differences in adults, excepting the tint of the markings, which varies from light to dark brown. The bands on the middle tail-feathers are sometimes continuous or direct across both webs, and sometimes alternate.

Habits.—It appears that the only part of Britain which can lay claim to this species as a permanent inhabitant, is Shetland, where, however, it is not numerous, although several specimens have been obtained. It has also been more than once procured in Orkney. In the spring of 1833, after a severe gale from the north, an individual was wounded and caught on the Culbin Sands, near the mouth of the river Findhorn, my authority for which fact is the Rev. Mr Gordon of Birnie. Mr Selby states that in the latter part of January 1833, during a severe snow-storm, two individuals, a male and a female, were killed near Rothbury in Northumberland. Mr Denny states that on the 13th of February 1836, a male was shot three miles below Selby-on-the-Moor, in Yorkshire. It is remarkable that no instances are recorded of its having been met with on our western coasts, although specimens have been obtained in various parts of Ireland.

As a British species, the Snowy Owl was first described in 1812, by Mr Bullock, who met with it in the course of a tour through Orkney and Shetland. But, as will presently be seen, it had previously been found by Dr Laurence Edmondston, of Shetland, who in 1822 published a detailed account of its habits in the Transactions of the Wernerian Society of Edinburgh. That gentleman being the only person who has recorded observations made upon it in this country, an extract from his paper cannot fail to be interesting.

"Its form and manner are highly elegant; its flight less buoyant, and more rapid, than that of the other owls; and the superior boldness and activity of its disposition, the uncommon size of its talons, and vigour of its limbs, secure it against danger from feathered enemies. It affects solitary, stony, and elevated districts, which, by the similarity to it in colour of the rocks, render it difficult to be discovered, and by the inequali-

ties of their surface afford it shelter from the rays of the sun; but on the approach of twilight, it may be seen perching on the exposed eminences. It then quits its haunts, and frequents the cultivated fields, prowling over the low grounds in quest of mice and small birds. When first observed to leave its retreat, it is frequently assailed by crows and other birds; but it receives their attacks rather as an amusement than an annoyance, and dashes through the air despising their hostility. It preys chiefly on sandpipers, on which it pounces with precision and agility as it skims along the marshes. The specimen given to Mr Bullock's museum had an entire one in its stomach when I shot it; and a mouse perfectly whole was taken from that of the present specimen. I may here remark, that the stomach appears to be peculiarly small, and less membranous than what occurs in other carnivorous birds, and the food seems to be swallowed entire; indeed, its bill being feathered to its point, renders this almost necessary."

With regard to the stomach I must here offer a few remarks. I have carefully examined the digestive organs of several individuals, and have described and figured those of one in my First Volume, p. 62, Pl. V. In it the stomach was not small, nor more muscular than that of the Eagle-Owl; but its inner coat or epithelium was thick and very rugous; which I think often happens in birds kept in confinement, as was the case with this. Another individual was preserved in spirits. My description of its digestive organs, in the fifth volume of Mr Audubon's Ornithological Biography, contains the following passage relative to the part in question. "The stomach is large, roundish, two inches two-twelfths in length, two inches one-twelfth in breadth, its muscular coat very thin, being composed of a single series of fasciculi; the inner coat thick, moderately tough, and rugous." Again, the feathers about the bill do not render it necessary that its prey should be swallowed entire; and observations made in America on wild birds, and at Dr Neill's on a captive, shew that the Snowy Owl can tear its prey into morsels as readily as an Eagle or a Hawk. These circumstances I mention because ornithology requires to be purified of erroneous facts and inferences.

I have recently been favoured by Dr Edmondston with the following notice respecting this beautiful bird :—" The first time I saw it was in 1808. An individual had been shot by a lad who hung it up as a scarecrow. At that period I knew nothing of book ornithology, or of animals, farther than might be expected of a boy passionately devoted to the observation of their habits and distinctions. The next opportunity of seeing one was in the spring of 1812, and when I had enjoyed the privilege of a little acquaintance with the High Priest of Natural History, Linnæus. A few days after I succeeded in shooting the individual, the skin of which I presented, about a month or two afterwards, to my friend Mr Bullock, who was then on a visit here collecting materials for his beautiful museum in London. He had seen the bird in Orkney in July 1812, but this was the first specimen he had obtained, and it was the first recorded instance of one being killed in Britain. It continued to be exhibited in his collection till its dispersion. At the same time I communicated to him the facts and observations I had collected regarding the species, and which I afterwards published in the Memoirs of the Wernerian Society of Edinburgh ; and in this manner were the claims of the Kat-yogl to British citizenship first advanced.

" I have always doubted whether it bred here. Presumptions were in favour of the affirmative, but actual proof was wanting. I have been lately informed that its nest was found two years ago, in August, in a low rocky ledge not far from here. The young, three in number, fully fledged, were of a brown colour, sprinkled with grey. If it migrate at all, it is in winter, though even during that season I have met with it. I have seen it many times and in different localities, but I never saw one in that state of plumage which I am led to think is that of the young. The predominant colour of all was white, a little more or less dotted with brown, hardly ever more so, I think, than the specimen given to the Edinburgh Museum alluded to by you in your ' Rapacious Birds.' The females are much larger than the males, and less white in the plumage.

" It is not a common or easily discovered bird ; but I do not

recollect a year or season, when attentively looking out for it, and familiar as I am with its habits and favourite haunts, in which I have failed to discover it. It is by no means shy, and there is little difficulty in approaching it within near shot, until it has been fired it, or otherwise alarmed. It is easily rendered familiar, if I may judge by observations made on individuals wounded and kept confined; and its disposition appears gentle and intelligent. I should be apt to call it an *amiable* owl. It is viewed as a bird of evil augury, and to this superstitious fear which it inspires it has no doubt often been indebted for its protection.

"Whatever ornithologists may assert of its habits in America, it does not prey by day in Shetland, nor, so far as I know, in other parts of Europe where it is found. Perhaps the freer republican institutions of the New World afford more scope for its *enlightened* rapacious propensities than do the disciplined habits, dull despotism, and dense population of the Old, and thus transform the bird of Minerva into that of Jove, staring even Phœbus out of countenance."

The Snowy Owl occurs in the northern parts of the continent of Europe, whence it migrates southward at the approach of winter. It is equally an inhabitant of North America, where it appears to be more abundant; and as its habits have been observed there by Mr Audubon and Dr Richardson, it may be proper to present an extract from the writings of each of these celebrated naturalists. The former writes thus:—

"The Snowy Owl hunts during the day, as well as in the dusk. Its flight is firm and protracted, although smooth and noiseless. It passes swiftly over its hunting ground, seizes its prey by instantaneously falling on it, and generally devours it on the spot. When the objects of its pursuit are on wing, such as ducks, grouse, or pigeons, it gains upon them by urging its speed, and strikes them somewhat in the manner of the Peregrine Falcon. It is fond of the neighbourhood of rivers and small streams, having in their course cataracts or shallow rapids, on the borders of which it seizes on fishes, in the manner of our wild cat. It also watches the traps set for musk-rats, and devours the animals caught in them. Its usual food while it

remains with us, consists of hares, squirrels, rats, and fishes, portions of all of which I have found in its stomach. In several fine specimens which I examined immediately after being killed, I found the stomach to be extremely thin, soft, and capable of great extension. In one of them I found the whole of a large house-rat, in pieces of considerable size, the head and the tail almost entire."

Dr Richardson also informs us that it hunts by day, and remarks that unless it could do so, it would be unfit to pass the summer within the arctic circle, where at that season there is no night. "When seen on the barren grounds, it was generally squatting on the earth, and, if put up, it alighted again after a short flight, but was always so wary as to be approached with great difficulty. In the woody districts it shews less caution; and, according to Hearne, has been known to watch the grouse-shooters a whole day, for the purpose of sharing in the spoil. On such occasions it perches on a high tree, and, when a bird is shot, skims down and carries it off before the sportsman can get near it. It preys on lemmings, hares, and birds, particularly the willow-grouse and ptarmigan. I have seen it pursue the American hare on the wing, making repeated strokes at the animal with its foot; but on that occasion, through the intervention of an Indian, it was driven from its quarry."

In a state of captivity this bird is found to be gentle, and at first very timid. One which Dr Neill kept for some months, and which was procured in Sanda, one of the Orkney Islands, in April 1835, I had opportunities of observing. On a level surface, it stood with the body much inclined, the head raised, the wings hanging loosely along the sides, one generally having the tip placed over that of the other. On a perch it secured itself by directing the outer toe backwards, and inserting the tips of all the claws. It was easily alarmed, or irritated, and then raised its head, opened its mouth wide, hissed exactly in the manner of a cat, and at times clicked its mandibles. Occasionally when displeased, it uttered a sharp low cry, somewhat resembling the syllable *quee* quickly repeated. I did not see it until the winter, when its plumage was marked in the

manner usually considered as indicative of youth; but it had moulted in the previous autumn, and when procured had the markings still larger. It died in the beginning of April, when its body having been sent to me by Dr Neill, I had an opportunity, for the first time, of examining the interior of a Snowy Owl. As already mentioned, its digestive organs have been described and figured in my First Volume.

An individual kept by Mr Macculloch of Pictou, was at first very timid, and ultimately very gentle. Of three young birds reared from the nest, as mentioned by Mr Thompson, two were wild, sometimes fasting for one or two days, though food was within reach, while the other, a female, was somewhat playful and quite familiar even with strangers. These birds were not affected by bright sunshine, and were capable of observing birds passing at a great height in the air.

M. Temminck states that the Snowy Owl "nestles in steep rocks, or on the old pines of the frozen regions; and lays two eggs," which, according to M. Vieillot, are marked with black spots, but, according to other naturalists, of a pure white. Dr Richardson says that in the northern regions of America it "makes its nest on the ground, and lays three or four white eggs, of which two only are in general hatched."

Young.—According to M. Temminck, the young are at first "covered with a brown down, and their first feathers are also of a light brown." Dr Edmondston, it has been seen above, was informed that three young birds "of a brown colour sprinkled with grey" had been seen in Shetland. Mr Audubon says "I have shot specimens which were, as I thought, so young as to be nearly of a uniform light brown tint, and which puzzled me for several years, as I had at first conceived them to be of a different species. This indeed led me to think that, when young, these birds are brown." Afterwards however he declares that the young are "pure white." The truth appears to be that from personal observation no ornithologist can say whether they be pure white or pure scarlet. Mr Thompson however has thrown some light on the subject. In the Annals of Natural History, Vol. I, p. 242, he states that his

friend Mr Langtry received in October three Snowy Owls which had been taken in the previous month of August, from a nest on the coast of Labrador, at which time they were covered only with down.

"On arrival, when they were in good condition, the birds under consideration were as follows:—One much smaller than the others, and presumed to be a male, was considerably whiter than the specimen shot in a wild state (which was white, with the upper parts spotted and barred, and the breast and sides finely and distantly undulated with brownish-black), but displayed two markings which it does not possess; the back of the head where it joins the body being blackish-brown, and another patch of this colour on the body just before the carpal joint of the wing. The supposed females, which are much larger than the last mentioned, differ exceedingly from it in markings. They have the facial plumage, or that within the disk, the throat, body beneath the wings, under surface of the latter, and the legs and toes pure white. The plumage of the head from the disk posteriorly, back, upper side of wings, and whole under plumage between the folded wings, presents as much of a blackish-brown colour as of white, the former being disposed in the same manner as described in the specimen above alluded to; but the bars and other dark markings are so broad as to occupy equal space with the white or ground colour."

Progress toward Maturity.—According to Mr Audubon and Dr Richardson, the brown spots and bars on the plumage gradually contract as the bird advances in age. Those individuals which are almost entirely white are therefore supposed to be very old; and this change is in analogy with that undergone by the Jer Falcon.

3. Surnia nudipes. Gould. The Bare-toed Day-Owl.

~~1. Athene nudipes. Gould. The Bare-toed Athene.~~

~~SYRNIA PSILODACTYLA. THE BARE-TOED DAY-OWL.~~

LITTLE OWL. PASSERINE OWL.

Chouette Chevêche. Strix passerina. Temm. Man. d'Orn. I. 92. III. 49.
Little Owl. Noctua nudipes. Gould. Birds of Europe.
Little Night-Owl. Strix passerina. Aud. Orn. Biogr. V. 269.
Little Night-Owl. Noctua passerina. Selb. Illustr. 107.
Noctua passerina. Little Owl. Jen. Brit. Vert. An. 94.

Toes covered with shaft-bristles, between which the scales are apparent; upper parts brown, the head with linear-oblong, the neck, back, and wings with roundish, the tail with four bands of transverse, white spots; lower parts yellowish-white, with longitudinal brown spots.

Male.—This species, which has frequently been confounded with another of smaller size, and having the toes densely feathered, may be compared to the Jay in bulk, although greatly inferior in weight, and differently proportioned. It has more of the appearance of an Ulula or Hooting-Owl than of a Syrnia or Hawk-Owl. Its ear however corresponds with that of the latter genus, and if its tarsi are a little longer, and less feathered than in it, the difference ^ mishr seems to be of little importance. It is at once distinguishable by having the toes covered with bristles only, from all our Owls, excepting the Screech-Owl, which otherwise has little resemblance to it, and the Scops Owlet, which has tufts on the head.

The head is very large, the neck short, the wings of moderate length, the tail small, the tarsi short, and the toes stout. The upper mandible has its outline curved from the base, the sides convex toward the end, the edges direct, the tip decurved and acute; the lower mandible has the angle wide, the dorsal line convex, the edges toward the end inflected and de-

Surnia nudipes.
~~Athene nudipes. Bare-toed Athene.~~

curved, with a sinus on each side close to the abruptly rounded tip. The cere is rather short, and bare above ; the nostrils roundish, each in the fore part of a remarkable bulge. The conch is of an elliptical form, five twelfths of an inch long, simple, and fringed. The tarsi are moderately stout, and covered with downy feathers ; but the toes with adpressed bristles, allowing the obscurely defined transverse series of scales to be seen, each moreover having two terminal scutella. The claws are long, stout, tapering, very acute, and little curved ; the first and fourth smaller and rounded beneath, the second flattened but narrow, the third with a thin inner edge.

The facial disk is incomplete, the feathers over the eye being of the ordinary kind, and even its lower part not entirely radiant, for its posterior portion has much of the usual texture of ear-coverts. The bristle-tipped plumelets at the base of the bill are long. The ruff is very inconspicuous and incomplete, the feathers being merely a little more curved than the rest. The plumage is very soft, on the lower parts downy, the feathers generally ovato-oblong. The wings are long and rounded ; the outer four sinuate on the inner web, and narrowed on the outer, the first with the tips of the filaments slightly recurved, the third longest, the fourth scarcely shorter, the second a little longer than the fifth, the first shorter than the sixth. The tail is short, nearly even, somewhat arched, and rather narrow.

The bill is greyish-yellow, somewhat dusky toward the base ; the claws yellowish-brown, with the tips dusky. The general colour of the upper parts is umber-brown, tinged with grey. On the upper part of the head are numerous linear-oblong white spots, there being one along the middle of each feather ; on the hind-neck the spots are large and roundish or irregular ; on the back and scapulars most of the feathers have two roundish spots ; the wing coverts one. All the quills have marginal whitish spots, those on the outer webs being triangular, on the inner transversely oblong. The tail is marked with four bands of narrow transverse spots. The anterior feathers of the disk are whitish, with dusky shafts, the lower whitish, barred and tipped with greyish-brown, the posterior brown tipped with

white. The throat is white, and a band of that colour curves upward on each side to the ear; on the fore-neck is a brownish belt, and beneath it a white space; the general colour of the rest of the lower parts is yellowish-white, each feather with a broad longitudinal band of brown; the abdominal and subcaudal feathers unspotted; the tarsal yellowish, with some faint brown spots externally.

Length to end of tail $10\frac{1}{2}$ inches, to end of wings 10; wing from flexure $6\frac{1}{4}$; tail 3; bill along the ridge $\frac{1}{1}\frac{0}{2}$, along the edge of lower mandible $\frac{8}{1}\frac{}{2}$; tarsus $1\frac{1}{4}$; first toe $\frac{5}{1}\frac{}{2}$, its claw $\frac{5}{1}\frac{}{2}$; second toe $\frac{9}{1}\frac{}{2}$, its claw $\frac{7}{1}\frac{}{2}$; third toe $\frac{1}{1}\frac{1}{2}$, its claw $\frac{6\frac{1}{2}}{1}\frac{}{2}$; fourth toe $\frac{7}{1}\frac{}{2}$, its claw $\frac{4\frac{1}{2}}{1}\frac{}{2}$.

Female.—The female resembles the male in colour, but is considerably larger. I have not however examined a sufficient number of specimens to be able to speak decidedly on this subject.

Variations.—In the few individuals which I have seen, there was considerable difference in the feathering of the tarsus, that part being in one feathered to the toes, but in another having its lower third as bare as the latter organs, that is, covered only with shafts. Similar differences I have seen in the Burrowing Owl of North America, the tarsal feathers becoming by being worn reduced to the shafts. The tint of the upper parts varies from umber-brown to wood-brown, becoming lighter toward the period of renewal.

Habits.—This Owl is of very rare occurrence in Britain, although instances are mentioned of its having been met with from Devonshire to Northumberland. It is said by M. Temminck to be found in almost all the countries of Europe, in places where there are old houses or deserted towers, and to be common in Holland and Germany, but not to extend northward beyond the 55th degree of latitude. Not having seen it alive, or met with a recent specimen, I cannot speak of its manners or internal structure. The former are described as similar to those of the smaller owls in general. It feeds

Surnia Athene nudipes.

on mice, small birds, and insects; frequents old buildings, towers, and churches, where it also nestles, laying two eggs, on which the male sits alternately with the female. According to some, it is nocturnal, and may easily be captured, on discovering its retreat, by placing a bag-net over its hole. In captivity, it thrives pretty well, and it is often exposed for sale on the Continent. This species not having been clearly distinguished by many authors from Strix Tengmalmi, it is not expedient to venture upon many remarks respecting it. I shall therefore conclude with an abridged extract from M. Valmont-Bomare. Its ordinary cry, which it repeats when flying, is *poupou, poupou;* but when settled it emits a louder and sharper cry, so distinct that one might take it for a person calling out *aîme, hême, êsme.* M. Buffon says that one of his people was so deceived by the cry of one at night, that he went to the window, and called out, "Who is down there? My name is not Edme but Peter." It is not entirely nocturnal, but flies during the day much better than any of the other owls, and often pursues swallows and other small birds, although seldom with success. It succeeds better with mice and young rats, which it tears to pieces with its bill and claws. It also plucks birds very neatly before eating them, whereas most other owls swallow feathers and all. It lays five eggs, which are spotted with white and yellowish.



Fig. 240.

Genus III. SCOPS. OWLET.

The genus Scops is composed of several small Owls, of which the more remarkable characters indicate a station intermediate between the genera Strnia and Bubo. They have the small and simple conch of both, but differ from the former in generally having elongated tufts on the head, and from the latter in having the wings longer, the tarsi more slender, and the toes more or less bare.

Bill short, stout, compressed toward the end: upper mandible with the dorsal line curved from the base, its sides slightly convex, the edges anteriorly sharp, the tip prolonged, acute, and decurved; lower mandible with the angle wide, the dorsal line convex, the edges decurved, with a slight notch on each side, close to the rounded tip.

Nostrils roundish. Eyelids with broad thin crenate margins, and without distinct ciliary fringes, although feathered. Conch elliptical, simple, about a third of the height of the head.

Head very large, roundish; neck short; body slender. Legs rather short; tarsi slender, feathered; toes short, bare, reticulate, at the end scutellate; claws long, slightly curved, tapering, compressed, acute, narrow beneath, but that of the third toe with a thin inner edge.

Plumage full and soft, on the upper parts somewhat compact. Facial disks incomplete above the eyes; ruff inconspicuous and incomplete. Feathers generally ovato-oblong; those of the abdomen downy, of the tibiæ silky, of the tarsi short, and somewhat dense. Wings long, with the third quill longest. Tail rather short, slightly rounded, of twelve somewhat arched feathers. Some of the species, as Strix portoricensis, are destitute of tufts on the head.

1. SCOPS ALDROVANDI. ~~THE~~ ALDROVANDI~~NE~~ OWLET.

SCOPS EARED OWL. LITTLE HORNED OWL.

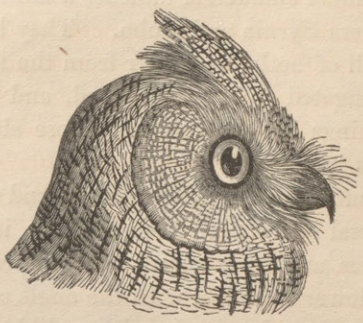


FIG. 241.

Strix Scops. Linn. Syst. Nat. I. 129.
Strix Scops. Lath. Ind. Orn. I. 56.
Little Horned Owl. Mont. Orn. Dict.
Hibou Scops. Strix Scops. Temm. Man. d'Orn. 103.
Scops-eared Owl. Scops Aldrovandi. Selb. Illustr. I. 92.
Bubo Scops. Scops-eared Owl. Jen. Brit. Vert. An. 91.

Head with tufts of about twelve feathers; plumage light grey variegated with brown, and marked with longitudinal brownish-black lines and transverse undulations; length about eight inches.

THIS pretty little Owl being of very rare occurrence in Britain, I have never met with it alive, nor even examined a fresh specimen, so that the following description is necessarily taken from preserved individuals, of which the sex had not been perhaps accurately determined.

MALE.—The general form is not materially different from that of the Great Eagle-Owl, although the wings and tarsi are

longer. The head is very large, broad, and rounded, the bill short, stout, compressed toward the end, with the upper outline decurved, the lower convex, the cere of moderate length, the tip of the upper mandible acute, that of the lower rounded. The tarsi are of moderate length, and covered with short rather compact feathers; the toes bare, each with four terminal scutella; the claws slightly curved, compressed, very acute. The conch of the ear elliptical, four twelfths of an inch long. The nostrils roundish and large.

The plumage is full, on the upper parts more compact than in any other British Owl; the feathers generally ovato-oblong and obtuse, on the sides and tibiæ very long and downy. The facial disks are discontinued over the eyes, and the ruff is short and inconspicuous. On each side of the head, over and behind the eye, is a large tuft of about twelve feathers. The wings are very long; the third quill longest, the second scarcely shorter, the first nearly as long as the sixth. The tail is rather short, slightly arched, and somewhat rounded.

The bill is black; the claws whitish at the base, dusky at the end. The general colour of the plumage is light grey, the fore part of the back tinged with reddish-brown, all the feathers with a central brownish-black line, and transverse minute undulations of the same colour. On the outer scapulars is a large whitish spot near the end; the quills are banded and undulated with greyish-brown and greyish-white, the primaries having conspicuous white spots between the brown bands on the outer web; the tail similarly marked. The facial disks minutely dotted with brown; the lower parts greyish-white, undulated with brown, and longitudinally streaked with dusky; the tarsal feathers brownish-grey, with a median dark line.

Length to end of tail $7\frac{1}{2}$ inches; wing from flexure $6\frac{1}{4}$; tail $3\frac{1}{4}$; bill along the ridge $\frac{9}{12}$; tarsus 1; hind toe $\frac{5}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; second toe $\frac{7}{12}$, its claw $\frac{5}{12}$; third toe $\frac{9}{12}$, its claw $\frac{4\frac{1}{2}}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{4\frac{1}{2}}{12}$.

Female.—The female is somewhat larger than the male, and has more brown on the upper parts, but is otherwise similar.

Length to end of tail $8\frac{1}{2}$ inches; wing from flexure $6\frac{1}{2}$; tail $3\frac{2}{12}$; bill along the ridge $\frac{3}{4}$; tarsus 1; hind toe $\frac{5}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; third toe $\frac{9}{12}$, its claw $\frac{4\frac{1}{2}}{12}$.

Habits.—This species was introduced into the British Fauna by Montagu, "upon the undoubted authority of Mr Foljambe, of Osberton, an accurate ornithologist," who had in his collection a specimen shot in Yorkshire, and, besides being aware of another in that of Mr Fothergill, of York, had heard of others that had been seen in the same county. Since that time, several individuals are recorded as having been obtained in various parts of England, where however the species is of very rare occurrence, and supposed to be merely migratory. It is said not to extend to the northern parts of the Continent, but to be not uncommon in the southern portions of Germany and in France, to become plentiful in the countries bordering on the Mediterranean, and to occur in Africa, as well as in Asia. Authors state that it feeds on mice and large insects, is of nocturnal habits, nestles in the fissures of rocks or in cavities in decayed trees, and lays from two to four roundish white eggs. Mr Spence, the celebrated entomologist, informs us, in the Magazine of Natural History, that in summer it is very common in Italy, where it is remarked for constantly repeating its plaintive and monotonous cry of *kew*, *kew*, at regular intervals of about two seconds all night long. In that country it feeds wholly on beetles, grasshoppers, and other insects, and takes its departure when the cold season approaches, in order to pass the winter in Africa and southern Asia.

Genus III. BUBO. EAGLE-OWL.

The Eagle-Owls are perhaps not generically well distinguished from those of the genus last described, with which they agree in most particulars, differing however in their large size, short and stout tarsi, and comparatively shorter and more rounded wings.

Bill short, robust, compressed toward the end; upper mandible with the cere large, the dorsal outline decurved from the base, the ridge broad and convex, towards the end narrowed, the sides convex and nearly erect beyond the cere, the tip subtrigonal, acute, decurved so as to be nearly perpendicular; lower mandible straight, with the crura short, the angle wide and rounded, the dorsal line short and slightly convex, the edges toward the end sharp and inflected, ultimately decurved, with a distinct sinus on each side close to the abrupt tip.

Mouth very wide; palate flat, sloping upwards at the sides, with two longitudinal papillate ridges, between which are numerous small reversed papillæ, and a median ridge toward the mandible. Posterior aperture of the nares short, elliptical, with an anterior slit. Tongue short, oblong, sagittate and papillate at the base, its upper surface with a median longitudinal groove, the sides nearly parallel, the tip rounded, and retuse. Œsophagus very wide, without dilatation; proventriculus studded with cylindrical glandules, and dilated below. Stomach large, roundish; its muscular coat very thin, being composed of a single series of fasciculi; the central tendons small and thin; the inner surface smooth and soft. Pylorus very small, without valvular prominences. Intestine of moderate length, rather wide; cœca large, oblong, narrowed at the base; cloacal dilatation globular and very large. Plate XXI, Fig. 4.

Nostrils roundish or elliptical, oblique, in the fore part of

the cere. Eyes extremely large, fixed, oblique; eyelids with broad thin crenate margins, and ciliary fringes of short distantly barbed feathers, the upper eyelid much larger. Conch of the ear simple, elliptical, very large, being from a third to half the height of the skull, its slightly elevated margin fringed with slender feathers. Fig. 242.

Head very large, broad, somewhat flattened above, anteriorly narrowed; neck short; body short, stout, of greater depth than breadth, much narrowed behind. Legs rather short, stout; tibia of moderate length; tarsus short, rounded, closely feathered; toes short, strong, covered with short close feathers; all with two scutella at the end, padded and with conical papillæ beneath; the first very short, with much lateral motion; the fourth longer, and reversible so as to be placed at a right angle to the third, which is considerably longer than the second. Claws long, well-curved, tapering, very acute, rounded above, convex on the sides, narrow beneath; the third with a dilated inner edge.

Plumage very full and soft, somewhat firm above, but blended. Facial disks incomplete above the eyes, their feathers oblong, with loose filaments, the anterior longer, stiffer, and partially concealing the bill. Ruff incomplete and inconspicuous. Feathers in general oblong and rounded; those of the thorax and abdomen downy, but covered by two large bunches arising on the sides and fore part of the thorax. Wings long, very broad, much rounded; primary quills broad and rounded; the first three sinuate on the inner web, the first four with the outer web slightly cut out; the third quill longest; secondary quills about fifteen, very broad, and rounded. Tail of moderate length, broad, rounded, of twelve slightly arched, rounded feathers.

The birds of this genus are among the largest that occur in the family of Striginæ, presenting in this respect some vague analogy to the Eagles among the Falconinæ. Some of the smaller bear a great resemblance to the species of the genus Asio, which are equally furnished with tufts on the head, but are readily distinguished by the different form and much larger dimensions of their conch. They prey on quadrupeds and

birds, are not entirely nocturnal in their habits, reside in wooded regions, and nestle in trees, on rocks, or on the ground. Some individuals of a single species have been obtained in Britain; but it does not appear probable that at the present day any permanently reside there.

The accompanying figure represents, of the natural size, as taken from a recent specimen, the external ear of the Great Eagle-Owl. The aperture of the ear, properly so called, or the entrance of the meatus auditorius externus, is of small size, and of an elliptical form. There is no operculum, but the margin is thickened all round, and beset with feathers, of which the shafts only have been represented.

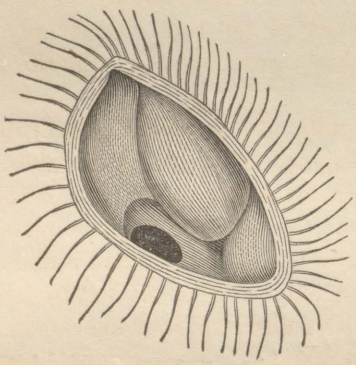


Fig. 242.

1. BUBO MAXIMUS. THE GREAT EAGLE-OWL.

GREAT HORNED OWL. GREAT EARED-OWL. GREAT OWL. ATHENIAN OWL. GRAND DUKE AND DUCHESS.



FIG. 243.

Strix Bubo. Linn. Syst. Nat. I. 131.
Strix Bubo. Lath. Ind. Orn. I. 51.
Great Eared Owl. Mont. Orn. Dict.
Hibou Grand-Duc. Strix Bubo. Temm. Man. d'Orn. I. 100.
Great-Horned or Eagle-Owl. Bubo maximus. Selb. Illustr. I. 82.
Bubo maximus. Eagle-Owl. Jen. Brit. Vert. An. 90.

Tufts of about eighteen feathers, projecting more than two inches beyond the plumage of the head; upper parts variegated with dark brown and light reddish-yellow; lower parts of the latter colour, with longitudinal blackish-brown spots and streaks, and

numerous transverse undulating lines; facial disks greyish-brown, obscurely barred; throat with a patch of white; bill and claws black toward the end, greyish-blue at the base.

Male.—The Great Eagle-Owl is the largest species of this family that occurs in Britain, where however it is very seldom met with, insomuch that I am obliged to have recourse to foreign specimens for description. An individual from Norway presents the following characters.

The body is robust, although, as usual, the feathers form the greater part of its bulk; the neck short; the head very large, flattened above, narrowed anteriorly. The bill is short, very robust, considerably compressed; the cere rather large, and nearly bare, although concealed by the feathers in the neighbourhood. The upper mandible has the dorsal outline decurved from the base, the ridge broad on the cere, and convex in its whole length, as are the sides toward the end, the edges soft and straight as far as the middle, then sharp, arched, with a faint lobe, the tip very strong, decurved, and acute; the lower mandible with the back and sides convex, the edges inflected toward the end, with a distinct notch on each side close to the rounded tip.

The nostrils are large, broadly elliptical, oblique, divided by a soft projecting ridge, their greatest diameter four twelfths of an inch. The eyes extremely large, fixed, and obliquely placed. Conch more than half the height of the skull, elliptical, an inch in length. The tibia is rather short; the tarsus short, robust, and with the toes feathered. The first toe very short, the second considerably longer than the fourth, and in about the same degree exceeded by the third; the two latter connected by a short web; all with three terminal scutella, and their lower surface padded and papillate. The claws are very long, curved in the third of a circle, the first in a semicircle, tapering, convex above and on the sides, with a groove beneath, excepting the third which is broader, with a dilated inner edge.

The plumage is very full, soft, blended, and elastic. The facial disks extend round two thirds of the eye, leaving the upper part covered with shorter feathers; those at the base of the cere are linear, with strong shafts and bristly filaments.

The eyelids are fringed with short feathers having disunited filaments. The ruff extends from a little above the ear to the chin, and is formed of oblong, slightly curved feathers. Over and above the eye, on each side is a double series of elongated feathers, of which there are nine in each row, the longest projecting upwards of two inches beyond the rest of the plumage. On the upper parts, the feathers are oblong and rounded ; on the throat downy, on the fore-neck ovato-oblong, on the upper part and sides of the thorax elongated, oblong, rather pointed, and covering those of the thorax and abdomen, which are downy. On the outer side of the tibia is a tuft of very soft elongated feathers ; and the tibiæ, tarsi, and toes are covered with soft blended feathers. The wings are long, of great breadth, and rounded ; the quills twenty-seven ; the primaries very broad, the first four cut out on the inner web near the end, the outer two only having an abrupt sinus ; the second, third, and fourth with the outer web slightly narrowed; the first with the barbs of the outer web free and recurved at their extremity in its whole length, the second and third toward the end. The first quill is an inch and a half shorter than the second, the third longest, exceeding the second by two twelfths, and the fourth by one twelfth. The tail is broad, arched, rounded, the lateral feathers being an inch shorter than the longest.

The bill is greyish-blue at the base, bluish-black toward the end ; the cere dusky ; the soft edges of the mandibles flesh-coloured, as is the inside of the mouth. The iris is bright orange ; the bare edges of the eyelids and the margin of the nictitant membrane dusky. The scutella are pale greyish-blue, the claws of the same colour as the bill ; the soles pale flesh colour.

The facial disks are pale yellowish-brown, faintly barred with dusky ; their anterior part greyish-white, with the shafts black at the end. The feathers of the lower eyelid are greyish-white, of the upper chiefly black. Those over the eye, and the long tufts, are brownish-black, internally edged or mottled with reddish. The general colour of the upper parts is reddish-yellow, spotted, barred, and minutely dotted with dark brown. On the lower part of the hind-neck, most of the feathers have

only a median longitudinal blackish-brown band. The small wing-coverts at the flexure, the alula, and the primary coverts, are almost entirely dusky. The quills are barred with brownish-black, and in the intervals yellowish-red, nearly pure on the inner webs, but on the outer closely and minutely undulated with brown. The tail is similar, but with less yellow. The feathers on the upper part of the throat are white; a band of barred and mottled feathers then crosses the throat, being continuous with the ruff; and on the middle of the neck is a white patch, with some dusky spots. The rest of the neck is reddish-yellow, each feather with an oblong brownish-black longitudinal band, and transverse lateral undulated bars. On the thorax and sides the feathers are similar, the central dusky patch gradually becoming narrower, and on those farthest back ceasing; while the narrow transverse bars become numerous in the same proportion. The large tibial feathers and lower tail-coverts are greyish yellow, mixed with red, and barred with dusky; those of the tibiæ more tinged with yellow, and more faintly barred. The downy or concealed part of the plumage is dark greyish-blue.

Length to end of tail 24 inches; extent of wings 58; wing from flexure 19; tail 11; bill along the ridge $2\frac{1}{2}$; cere $1\frac{1}{12}$; edge of lower mandible 2; tarsus $2\frac{9}{12}$; hind toe $1\frac{1}{4}$, its claw $1\frac{7}{12}$; second toe $1\frac{10}{12}$, its claw $1\frac{9}{12}$; third toe $2\frac{5}{12}$, its claw $1\frac{8}{12}$; fourth toe $1\frac{7}{12}$, its claw $1\frac{5}{12}$.

Female.—An adult female, which was presented to me by Mr Audubon, and which I killed for the purpose of examining its digestive organs, was in all respects similar to the above-described male, but somewhat darker in its tints. The tongue fleshy, oblong, an inch and two twelfths in length, deeply sagittate and papillate at the base, having the posterior half of its surface covered with small papillæ, its lower free part horny, the tip slightly emarginate. The entire length of the alimentary canal five feet two inches. The pharynx two inches wide, the mouth an inch and three-quarters. The œsophagus, Plate XXI, Fig. 4, *abc*, nine inches and a half in length; its outer coat very thin; its width from two inches to an inch and a half, when mo-

derately dilated. The proventriculus, *b c*, of which the glandules are very numerous and cylindrical, gradually dilates into the stomach, *c d*; which is roundish, somewhat compressed, three inches and a half in its greatest diameter; its muscular coat thin, and composed of a single series of fasciculi; the tendons roundish, very thin, about nine twelfths in diameter; the epithelium soft, smooth, and even. The intestine, *defg*, is forty-nine inches long; its diameter in the duodenal part nine twelfths, then gradually contracting to four twelfths. The cœca, Fig. 5, *cd*, *cd*, narrow for half their length, then enlarged into an oblong sac; one of them five inches long, the other four and a half. The rectum, *b c*, at first about eight twelfths in width, enlarges into a nearly globular cloaca, *j*, two inches in width.

Length to end of tail 26 inches, to end of wings 24; extent of wings 61; wing from flexure 20; tail 10 (somewhat worn); bill along the ridge $2\frac{5}{12}$, along the edge of lower mandible $2\frac{1}{12}$; tarsus $2\frac{3}{4}$; first toe $1\frac{1}{4}$, its claw $1\frac{10}{12}$; middle toe $2\frac{11}{12}$, its claw $2\frac{1}{12}$.

Habits.—The Great Eagle-Owl is said by authors to inhabit the continent of Europe, from Sweden, Norway, and Lapland, southward to the shores of the Mediterranean. It has also been obtained from some parts of Asia; but its range over that continent is unknown. M. Temminck states that it is very common in Russia, Germany, and Switzerland. Individuals have been obtained in Devonshire, Sussex, Yorkshire, the county of Durham, and one or two other districts in England. In Scotland, I am unable to refer to any authentic account of its capture. Mr Low, who is often quoted as an authority for its occurrence in Orkney, merely says he has been credibly informed that it "is still to be found, especially in the hilly parts, where it is often surprised sleeping." It can hardly be supposed now to breed in any part of Britain, so that the individuals occasionally seen there are probably stragglers from the continent.

* Mr. St. John All that appears to be known of its habits amounts to very little. It is not very uncommon in the Scandinavian countries, where it resides in the forests, feeds on quadrupeds

and birds, especially hares and grouse, forms a bulky nest, which is generally placed on a rock or on the ground, and deposits two or three broadly elliptical, white eggs.

The Bishop of Norwich, in speaking of the attachment of Owls to their young, relates the following instance, witnessed by a Swedish gentleman, who resided several years near a steep

* p 432.

Mr. St. John, in his "Wild Sports of the Highlands", says, I am much inclined to think that the great-eared owl, Strix bubo, is also occasionally a visitor to the wildest parts of this district. A man described to me a large bird, which he called an eagle. The bird was sitting on a fir-tree, and his attention was called to it by the grey crows uttering their cries of alarm and war. He went up to the tree, and close above his head sat a great bird, with large staring yellow eyes, as bright (so he expressed it) as two brass buttons. The man stooped to pick up a stone or stick, and the bird dashed off the tree into the recesses of the wood, and was not again seen again. I have no doubt that, instead of an eagle, as he supposed it to be, it was the great Strix bubo. The colour of its eyes, the situation the bird was in on the branch of a tall fir-tree, and its remaining quiet until the man approached so close to it, all convince me that it must have been the great owl, whose loud midnight hootings disturb the solitude of the German forests.

The iris exhibited the most delicate mobility, and was continually expanding or contracting. It frequently drew the nictitant membrane over the eye, generally employing both membranes simultaneously, but at times only one. Sometimes also it moved the upper eyelid of one eye while the other remained drawn up. When it was asleep, the upper eyelid covered more than two-thirds of the eye.

derately dilated. The proventriculus, *b c*, of which the glandules are very numerous and cylindrical, gradually dilates into the stomach, *c d*; which is roundish, somewhat compressed, three inches and a half in its greatest diameter; its muscular coat thin, and composed of a single series of fasciculi; the tendons roundish, very thin, about nine twelfths in diameter; the

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and birds, especially hares and grouse, forms a bulky nest, which is generally placed on a rock or on the ground, and deposits two or three broadly elliptical, white eggs.

The Bishop of Norwich, in speaking of the attachment of Owls to their young, relates the following instance, witnessed by a Swedish gentleman, who resided several years near a steep mountain, on the summit of which two Eagle-Owls had built their nest. One day, in July, a young bird, nearly fledged, was caught by the servants, and shut up in a large hen-coop. On the following morning a young partridge was found lying dead near the door of the coop; and night after night, for fourteen days, the same mark of attention was repeated. The gentleman and his servant watched several nights, in order that they might observe through a window, when and how this supply was brought; but in vain, although there could be no doubt that the parents of the bird were the caterers.

The one which I kept alive for some time, generally perched on the highest place it could find, inserting the tips of the first and fourth claws behind, the rest before. On a flat surface however the outer toe was not directed backwards, but outwards, and the claws extended. It generally rested the whole tarsus, and sometimes stood on one foot. When sleeping, it kept its feathers close, its neck erect, and the tufts on the head usually raised. It seemed incapable of walking, and in shifting its place leaped, assisted by its wings. When alarmed, or irritated, it raised its feathers, depressed its head, stared with expanded pupils, hissed at intervals like a cat, and snapped its bill.

The eyes reflected no light in the dark or twilight. When irritated or looking intently on an object, it dilated the pupil, and when listless or dozing with half-closed eyes, contracted it. The iris exhibited the most delicate mobility, and was continually expanding or contracting. It frequently drew the nictitant membrane over the eye, generally employing both membranes simultaneously, but at times only one. Sometimes also it moved the upper eyelid of one eye while the other remained drawn up. When it was asleep, the upper eyelid covered more than two-thirds of the eye.

In perching it steadied itself with its wings, which it often, even when undisturbed, extended and flapped for a minute or more. On being roused from sleep it sometimes yawned, stretched out and flapped its wings, and extended its legs in succession. It trimmed its feathers with its bill, but never applied to the uropygial gland, and in scratching its head and cheeks, invariably used the inner dilated edge of the middle toe. When it observed an object which it thought it might capture, it stood erect on its toes, drew its feathers close, stretched out its neck, raised its tufts, and fixed its eyes so steadfastly on it, that its attention could not be diverted even by pushing it with a stick.

One kept by Sir William Jardine, he describes as being extremely active at night, when he "sometimes keeps up an incessant bark, so similar to that of a cur or terrier, as to annoy a large Labrador house-dog," who, in replying, nightly disturbed his neighbours.

Young.—The young, which at first are covered, according to Linnæus, with soft whitish down, are when fledged similar to their parents, but with the lighter tints more tinged with red.

Genus IV. ULULA. HOOTING-OWL.

The species of this genus closely resemble those which have been united under the generic designation of Syrnia, from which however they are distinguished by having the head larger, the neck thicker, the facial disks more expanded, the ruff complete so as to encircle the face, and the conch furnished with a prominent anterior operculum.

Bill short, strong, compressed toward the end: upper mandible with the cere large, and tumid behind the nostrils, the dorsal outline decurved from the base, the ridge broad, convex, anteriorly narrowed, the sides rapidly sloping, convex toward the end, the tip trigonal, acute, decurved so as to be nearly perpendicular; lower mandible straight, with the crura short, the angle wide and rounded, the dorsal line convex, the edges toward the end sharp, inflected, anteriorly decurved, with a sinus on each side close to the abruptly rounded tip.

Mouth very wide; palate flat, sloping a little upwards at the sides with two longitudinal ridges, and a median tuberculated ridge toward the mandible. Posterior aperture of the nares oblong, with an anterior slit. Tongue short, narrow, deeply sagittate and papillate at the base, covered above with minute papillæ, its sides nearly parallel, the tip rounded and emarginate. Œsophagus wide, without dilatation. Stomach very large, roundish; its walls very thin, the muscular coat composed of a single series of fasciculi; the inner surface soft and slightly rugous. Aperture of the pylorus extremely narrow, with a semicircular flap. Intestine of moderate length, rather wide; cœca large, oblong, narrowed at the base; cloacal dilatation globular and very large.

Nostrils roundish, near the ridge, in the fore part of the cere, which is tumid behind them. Eyes very large, obliquely situated, slightly mobile; eyelids with broad, thin, papillate margins, but without distinct ciliæ. Conch of the ear somewhat elliptical, extending from the level of the upper part of the eye to the base of the lower jaw, and having an anterior semicircular operculum, fringed with linear-oblong feathers; the meatus auditorius oblique, elliptical, at the lower part of an elliptical deep cavity, which is about half the length of the conch.

Head extremely large, broad, rounded, or somewhat triangular, with the sides flattened and sloping forwards; neck short; body short, slender, of greater depth than breadth anteriorly, much compressed behind. Legs of moderate length, stout; tibia rather long; tarsus short, feathered; toes short, covered with feathers of which the filaments are hair-like and separated; all with two scutella at the end, padded and papillate beneath; the first very short, with much lateral motion, the fourth reversible and shorter than the second, the third not much longer. Claws long, well curved, tapering, very acute, compressed, rounded above, slightly convex on the sides, narrow beneath, the third with a dilated inner edge.

Plumage very full and soft, somewhat compact above, blended beneath. Facial disks very large, complete or entirely surrounding the eye, and composed of stiffish linear-oblong feathers with loose barbs; the anterior longer, more bristly, and partially concealing the bill. Ruff complete and conspicuous. Feathers in general oblong, rounded; those of the abdomen downy, of the legs with soft disunited filaments. Wings long, very broad, convex, much rounded; primary quills broad and rounded, the first five cut out on both edges, abruptly on the inner; the fourth longest, the first about the same length as the tenth; secondary quills thirteen, broad, and rounded. Tail broad, rounded, of twelve arched, rounded feathers.

To this genus belong, as I have ascertained by the examination of recent specimens, Strix nebulosa, Strix cinerea, Strix acadica, Strix Aluco, and Strix Tengmalmi, of authors; al-

though the first two, having the conch proportionally smaller, might perhaps be referred to a genus apart. In Britain two species are met with, one common and generally distributed, the other of rare occurrence.

The accompanying figure represents the ear of the Tawny Owl, Ulula Aluco, which is proportionally larger than that of the Eagle-Owl, and moreover furnished with an anterior operculum or flap.

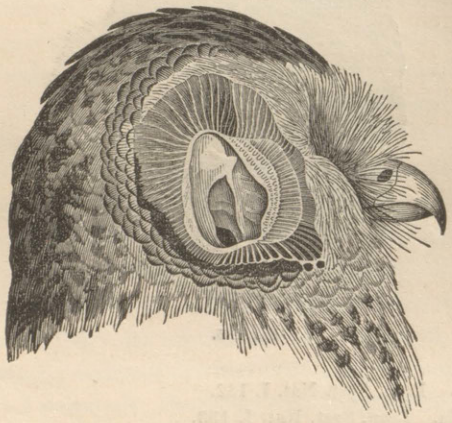


Fig. 244.

Linn.

1. ULULA ALUCO. THE TAWNY HOOTING-OWL.

BROWN OWL. TAWNY OWL. WOOD OWL. GREY OWL. IVY OWL. BEECH OWL. SCREECH OWL. HOWLET. JENNY HOWLET. CUMHACHAG. CAILLEACH-OIDHCHE.



FIG. 245.

Strix Aluco. Linn. Syst. Nat. I. 132.
Strix stridula. Linn. Syst. Nat. I. 133.
Strix Aluco. Lath. Ind. Orn. I. 59.
Strix stridula. Lath. Ind. Orn. I. 58.
Tawny Owl. Mont. Orn. Dict.
Chouette Hulotte. Strix Aluco. Temm. Man. d'Orn. I. 89.
Tawny Owl. Ulula stridula. Selb. Illustr. I. 103.
Syrnium Aluco. Tawny Owl. Jen. Brit. Vert. An. 93.

Upper parts in both sexes brownish-red, more or less tinged with grey, marked with longitudinal dark-brown streaks, and transverse lines of a lighter tint; the lower parts reddish-white, or yellowish, with longitudinal linear-lanceolate and transverse undulated dark-brown markings; large white spots on some of the scapulars and wing-coverts; bill greyish-yellow; iris bluish-black. Young birds more tinged with red, old birds more grey.

MALE.—The Tawny Owl has the appearance of a remarkably full and robust bird, having the head proportionally larger

than that of any other British species; but for this portliness it is indebted chiefly to its ample covering of extremely soft feathers, for when plucked, its body is ~~very~~ small, and its muscular apparatus of ~~very~~ moderate development. *The following description is that of an adult male, obtained near Edinburgh, in January 1841.*

The bill is short, rather stout, considerably compressed; the upper mandible with its outline decurved from the base, the sides rapidly sloping, slightly convex, the tip acute and decurved; the lower mandible with the crura narrow, the angle wide and rounded, the dorsal line short and slightly convex, the edges anteriorly decurved, with a sinus close to the tip, which is obliquely rounded.

The mouth is very wide, measuring an inch and three-fourths across; the palate flattened, with two lateral longitudinal soft ridges, and an anterior tuberculate ridge running to the tip of the mandible; the lower mandible deeply concave, with a prominent median line. The tongue small, seven-twelfths long, concave above, and emarginate. The œsophagus is five inches *and a half* in length, very wide, without dilatation; the proventriculus with a belt of very small cylindrical glandules, and gradually enlarged into the stomach, which is when inflated two inches in diameter, roundish; its muscular coat very thin, being composed of a single series of distinct fasciculi; the central tendons very thin and roundish; the inner coat soft and slightly rugous. The pylorus is extremely narrow, and closed by a thin valvular margin. The intestine is twenty-~~five~~ inches long, from four- *seven* twelfths to two-twelfths in width. The cœca, which come off at the distance of three inches from the extremity, are oblong, narrowed toward the base, three inches in length, ~~four~~-twelfths *and three quarters* *five* in their greatest width, *The rectum three inches and a half in length, with a globular dilatation an inch and two twelfths in diameter.*

The nostrils are roundish, in the fore edge of the cere, which is somewhat prominent behind them, and although bare above and anteriorly, concealed by the bristly feathers at the base of the bill. The eyes are very large, oblique, slightly mobile; the eyelids with a bare crenate margin. The conch of the ear *semilunar or* is of a somewhat elliptical form, an inch and a twelfth in length, extending from near the top of the head to the base of the lower jaw, having an elevated margin behind, and a distinct semi- *broad* circular operculum before, both beset with linear-oblong feathers. *half an inch in breadth.*

The plumage is very full, elastic, and extremely soft. The facial disks are complete, though narrower above the eyes. The ruff also is complete, extending from the base of the upper mandible to the throat, and composed of narrow recurved feathers. The feathers in general are oblong, with their downy part greatly extended, those on the upper parts somewhat compact, on the lower almost downy; on the tarsi and toes very soft and blended. The wings are long, very broad, much rounded; the outer six ~~quills~~ a little sinuate on the outer and inner webs; the barbs of the outer web of the first, and the sinuate portion of the second and third, free and recurved; the first two inches shorter than the second, which is ~~one inch~~ nine twelfths shorter than the third, the fourth a quarter of an inch longer than the latter, and slightly exceeding the fifth; the secondaries thirteen, very broad and rounded. The tail is of moderate length, arched, a little rounded, the lateral feathers nearly an inch shorter than those in the middle.

, with twenty-three quills

, tinged with

The bill is pale greyish-yellow, the cere flesh-coloured. The iris bluish-black. The soles of the feet are flesh-coloured, the claws greyish-yellow at the base, dusky toward the end. The inside of the mouth is light flesh-coloured, ~~excepting the anterior part of the palate, which is of a dull greyish-blue tint~~. The general colour of the upper parts is ~~light yellowish-red~~, longitudinally streaked, mottled, and transversely undulated with dark brown; the hind part of the back mottled and barred, with the streaks reduced to lines. Some of the outer scapulars, smaller wing-coverts, and outer secondary coverts, have a large white spot on the outer web toward the end. The quills are broadly barred with umber brown and ~~dull light~~ yellowish-~~red tinged with~~ grey; the primary coverts darker, but similarly barred. The tail-feathers, except the two middle, which are like the hind part of the back, are marked like the quills, and tipped with ~~yello~~wish-white. But both they and the quills are finely barred or mottled with brown, especially toward the end. The facial disks are greyish-white, the anterior with black shafts, ~~those behind tinged with yellowish-brown~~. The ruff is yellowish-red, inclining to white anteriorly, mottled with brown above, at the middle brownish-black. The lower parts

The edges of the eyelids dull yellowish-red

pale reddish-grey

greyish-

grey

or pale grey

all faintly barred with dusky

, slightly tinged with yellow

are ~~yellow~~ish-white; the breast and sides longitudinally streaked, and transversely undulated with blackish-brown, ~~the latter also tinged with reddish~~. The legs are yellowish-white, faintly mottled with brown.

Length to end of tail 17 inches, to end of wings 17; extent of wings 31; wing from flexure $10\frac{1}{2}$; tail 6; bill along the ridge $1\frac{5}{12}$, along the edge of lower mandible $1\frac{4}{12}$; tarsus $1\frac{6}{12}$; first toe $\frac{7}{12}$, its claw $\frac{9}{12}$; second toe $1\frac{1}{12}$, its claw $\frac{10}{12}$; third toe $1\frac{3}{12}$, its claw $\frac{9\frac{1}{2}}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{8}{12}$.

Female.—The female, which is considerably larger, ~~resembles the male in colour~~ differs chiefly in being tinged with red. The bill is light yellowish-grey; the iris bluish-black; the claws yellowish-grey at the base, dusky toward the end. The general colour of the upper parts is pale yellowish-~~red~~, streaked and undulated with blackish-brown; many of the feathers on the nape, and some of the outer scapulars, smaller wing-coverts, and outer secondary coverts, with a white spot on the outer web toward the end. The lower parts are reddish-white, but otherwise marked as in the male, and the sides tinged with red. In the female, then, the upper parts are of a ~~somewhat duller~~ brown, and the lower more tinged with red; but otherwise the differences are not remarkable. In an individual obtained in June 1835, the œsophagus was five inches long; the stomach two inches and a half; the intestine thirty inches. One of the cœca was four inches three-fourths in length, the other a little shorter. The rectum three inches and a half long.

Length to end of tail 16 inches, to end of wings 14; extent of wings 34; wing from flexure 11; tail 7; bill along the ridge $1\frac{1}{2}$; tarsus $1\frac{1}{12}$; hind toe $\frac{8}{12}$, its claw $\frac{8}{12}$; second toe $1\frac{1}{4}$, its claw $\frac{10}{12}$; third toe $1\frac{1}{2}$, its claw $\frac{9}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{8\frac{1}{2}}{12}$.

Variations.—Individuals vary considerably in the tint and intensity of their colours, some having the upper parts of a much duller brown than others, and the lower with more white. As the period of moulting approaches, little change takes place in the colours.

* On the evening of the 21st September, 1851, I listened a long time to the cry of a bird of this species, in the woods of Banchory, near Aberdeen. It certainly exhibited no melancholy or mysterious sentation. At intervals a protracted loud and clear hoo-ĕ, was emitted; then a sound of a different character, less loud, and ending in a tremulous note:—hŭ-hoo ĕ-ĕ-ĕ-ĕ.

Habits.—In the northern parts of Scotland, this species is seldom if ever met with; but in the wooded portions of the middle and southern divisions, it is more frequently obtained than any other, excepting the Long-eared and Barn Owls. In most parts of England suited to its nature, it has also been observed, and in some is said to be nearly as common as any other species. Its habits are strictly nocturnal, and when forced from its retreat by day, it is oppressed by the glare of light, seems bewildered, and may easily be destroyed. It is generally in the shade of some dense wood that it reposes, usually in an elevated station among the branches, but sometimes on the ground. At night, it emits a loud and doleful cry, which has been likened to the syllables *hoo-hoo-hoo*, and which Buffon remarks "has a considerable resemblance to the cry of the wolf, a circumstance which induced the Latins to give it the name of *Ulula*, which comes from *ululare*, to howl or cry like the wolf."* Besides this hooting noise, as it is termed, it occasionally utters a harsh scream. Its food consists of young hares, rats, mice, moles, birds of various species, beetles, and other insects. Several persons have stated that it also feeds on fish, and I found the stomach of one nearly filled with earth-worms, which had been torn into fragments of about half an inch in length.

I have never seen the nest of this bird. Montagu, however, states that it breeds in the hollows of trees, sometimes in barns, prepares very little nest, or even deposits its eggs on the decayed wood. According to M. Temminck, it lays in the deserted nests of buzzards, crows, and magpies. The eggs, three or four in number, are pure white, smooth, an inch and eleven-twelfths in length, an inch and a half in breadth. The young, which are at first of a dull yellowish-grey colour, are supplied with mice, rats, and young hares. As stated by the Rev. Mr Bree in the Magazine of Natural History, Vol. I, p. 179, they are also fed with fish. "Some years since, several young owls were taken from the nest, and placed in a yew tree in the garden of Allesley Rectory, near Coventry. In this situation, the parent birds repeatedly brought them live fish, bull-heads (Cottus Gobio), and loach (Cobites barbatula), which had doubt-

less been procured from the neighbouring brook, in which these species abound. Since the above period, I have on more than one occasion found the same fish, either whole or in fragments, lying under the trees on which I have observed the young owls to perch after they have left the nest, and where the old birds were accustomed to feed them."

This Owl, as well as other species, has in fact been seen to seize fishes in the water. On this subject the Bishop of Norwich makes the following remarks: "It has been conjectured by some, that as fish are attracted by a light or any shining substance, there may be a luminous appearance in the large, round, and bright eyes of an Owl, like those of a cat, which are known to all for their glaring in the dark, by which the fish are attracted within reach of its beak or claws." Now, in the first place, I have carefully observed the eyes of two species of Owl, but found that they emitted no light in the dark; and secondly, in all the eyes of Owls that I have dissected, there is no tapetum, like that which reflects light in quadrupeds, but the choroid coat is entirely covered with pigmentum nigrum.

Young.—The young of both sexes resemble the adult, with this difference only, that they are more tinged with red.

Progress toward Maturity.—It appears that the older the individuals, the more grey they assume on the upper, and the more white on the lower parts; but at what period of life they assume the colouring which gave rise to the idea of a distinct species is not known. An individual which is presumed to be old may be described thus: The general colour of the upper parts is pale umber, tinged with grey, longitudinally streaked with darker brown, and transversely barred, undulated, and dotted with greyish-white and greyish-brown. The facial disks are greyish-white, the anterior feathers with the shafts black toward the end, those behind with a faint brown bar near the tip. The ruff is reddish above, white below, but marked with dark brown, that colour occupying nearly the whole of the feathers in the middle part. The lower parts are greyish-white, streaked and barred as in the young.

Remarks.—The habits of this species have not been minutely described by authors; and the differences in the tints of its plumage are not satisfactorily traced. Although my descriptions have been taken from recent specimens, as well as skins, I must confess that my knowledge of the Tawny Owl is not of the most respectable character. The young of both sexes are of more ferruginous tint than old birds, and so continue for at least a year; but whether the individuals of which the plumage is much tinged with grey, are of both sexes, has not yet been determined. If analogy be of any importance, we might infer from well ascertained facts that the young of both sexes are the tawny, and the adult the greyish birds. Thus, Dr Bachman, in Mr Audubon's Ornithological Biography, Vol. V, p. 329: "There is no doubt about the correctness of the changes of plumage of this species (Strix Asio), for I have seen it in its various stages from red to grey. I kept it more than a year in domestication, when it underwent all its changes. I have taken the young *red* birds from the nest, and the old in the same hole, very *grey*. The bird breeds in the red state the following spring, and does not become grey until two years old. Specimens have been procured partially red and grey in the intermediate state."

2. ULULA TENGMALMI. TENGMALM'S HOOTING-OWL.

Strix funerea. Linn. Fauna Suecica, p. 25.
Strix Tengmalmi. Gmel. Syst. Nat. I. 291.
Strix Tengmalmi. Lath. Ind. Orn. I. 60.
Chouette Tengmalm. Strix Tengmalmi. Temm. Man. d'Orn. I. 94.
Tengmalm's Night-Owl. Noctua Tengmalmi. Selb. Illustr. 105.
Noctua Tengmalmi. Tengmalm's Night-Owl. Jen. Brit. Vert. An. 94.
Strix Tengmalmi. Tengmalm's Owl. Fauna Bor. Amer. II. 94.

Upper parts chocolate-brown, spotted with white; tail with five rows of transversely elongated spots; lower parts yellowish-white, with longitudinal brown markings; tarsi and toes covered with downy feathers; length about ten inches.

This pretty little Owl, the Strix funerea of Linnæus, Strix passerina of many authors, and Strix Tengmalmi of Temminck, has often been confounded with ~~Syrnia passerina~~ already described, from which, however, it is easily distinguished by differences in colour, inferiority of size, and especially by the dense covering of feathers upon its toes, those organs in that species being almost bare. The American bird described by Dr Richardson, Mr Audubon, and others under the same name, and considered identical by them, has lately by the Prince of Musignano been named Nyctale Richardsoni, and viewed as distinct from his Nyctale Tengmalmi; but as he has not given descriptions, it is impossible to know whether this determination has been founded on reason, or caused by caprice. On this subject I shall presently offer some remarks, but in the meantime proceed to describe the bird, of which however my specimens are American.

Athene nudipes

Male.—In form this species resembles the Brown Hooting-Owl, and the Passerine Day-Owl; the head being very large,

the neck short, the body full, but only in appearance, owing to the thick and very soft plumage. The bill is short, very deep and strong; the upper mandible with its outline decurved from the base, the ridge and sides convex, the tip acute and at the end nearly perpendicular; the lower mandible with the angle wide, the dorsal line slightly convex, the edges inflected, and toward the end decurved, with a distinct sinus on each side close to the abruptly rounded tip. The nostrils are broadly elliptical, oblique, in the fore part of the short cere, which bulges out behind them. The eyes are large. The conch is of an elliptical form, and of great size, being an inch and a quarter in length, extending from near the top of the head to the base of the lower jaw, and having an anterior semicircular operculum stretching along its whole length. It is thus very different from that of Syrnia passerina, being proportionally as large as that of Ulula Aluco, and precisely of the same form. The head is extremely large, and somewhat triangular. The feet are rather short; the tarsi and toes covered with very soft downy feathers; the latter having two scutella at the end. The claws are well curved, slender, compressed, and taper to a fine point.

The facial disk is complete, being composed of series of radiating feathers having disunited filaments. The ruff is also complete, extending from the base of the upper mandible to the throat, and composed of several series of narrow, slightly recurved, rather compact feathers. The plumage is full, very soft, and blended; the feathers broadly oblong and rounded at the tip. The wings are rather long, very broad, much rounded, and convex; the first five quills having the inner web cut out near the end; the second, third, and fourth with the outer narrowed; the first quill equal to the seventh, the second four twelfths of an inch shorter than the third, which is longest, but scarcely exceeds the fourth; the filaments of the outer web of the first with their tips free and recurved; those of the second and third similar toward the end. The tail is of moderate length, slightly arched, and somewhat rounded.

The bill is greyish-brown at the base, yellowish-white at the end; the claws yellowish-brown, with their tips dusky. The

general colour of the upper parts is chocolate-brown, or rather greyish-brown, tinged with olivaceous. The feathers of the head have each a central oblong white spot; those of the hind-neck are similarly marked with larger spots, some of which are so disposed as to form a semicircular band; the scapulars have two or four large round spots near the end; and some of the dorsal feathers and wing-coverts have single spots on the outer web. All the quills have marginal white spots on both webs; those on the inner much larger. On the tail are five series of transversely elongated narrow white spots. The facial disks are yellowish-white, anteriorly black, tinged with brown behind. The ruff also yellowish-white, mottled with black. The chin is white, the throat brown; the general colour of the lower parts yellowish-white, longitudinally streaked with brown. The central part of each feather being of the latter colour; some of the posterior lateral feathers have two white spots near the end. The plumage of the tarsi and toes greyish-yellow, with faint transverse bars of brown.

Length to end of tail $10\frac{1}{2}$ inches; bill along the ridge 1; wing from flexure $6\frac{10}{12}$; tail $4\frac{1}{4}$; tarsus $\frac{10}{12}$; hind toe $\frac{5}{12}$; its claw $\frac{5}{12}$; second toe $\frac{7}{12}$, its claw $\frac{7}{12}$; third toe $\frac{9}{12}$, its claw $\frac{8}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{5\frac{1}{2}}{12}$.

Female.—The female is considerably larger, but precisely similar in colour.

Length to end of tail $11\frac{1}{2}$ inches, to end of wings $10\frac{3}{4}$; wing from flexure $7\frac{1}{2}$; tail $4\frac{1}{2}$; bill along the ridge 1; tarsus $\frac{11}{12}$; first toe $\frac{5}{12}$, its claw $\frac{5}{12}$; second toe $\frac{7}{12}$, its claw $\frac{7}{12}$; third toe $\frac{9}{12}$, its claw $\frac{8}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{5\frac{1}{2}}{12}$.

Remarks.—The description given by Mr Selby from an individual killed at Morpeth, in Northumberland, in 1812, is as follows:—"Bill much curved and compressed; the culmen and tip yellowish-white, the sides dark-grey. Facial disk black at the posterior and anterior angles of the eye-orbits; the rest greyish-white, mixed with black. Ear-conch large, with a narrow operculum. Velvety feathers behind the auditory opening, brownish-black. Crown, nape, and hind part of the neck,

liver-brown, spotted with white; those upon the latter parts large, and surrounded by a margin of liver-brown. Back, wing-coverts, and scapulars, liver-brown, spotted with white; the spots upon the mantle nearly concealed by the overlaying tips of the feathers. Quills liver-brown; their exterior webs having three or four oval white spots, forming imperfect bars. Points of the outer barbs of the whole of the first quill open and reversed; those of the second the same for one-half of its length; of the third a small portion only near the tip. Third and fourth quill-feathers the largest in the wing; the third rather exceeding the fourth. The first and second having their inner webs notched, the second and third with their outer webs sinuated. Tail extending nearly an inch beyond the closed wings, liver-brown, crossed by five interrupted white bars, or rather rows of spots, the last about half an inch from the tip. Under plumage white, varied with paler liver-brown. Legs having the tarsi short, and, as well as the toes, thickly clothed with soft hair-like feathers. Claws of a tolerable length, and moderately incurved." This description agrees sufficiently with mine, and with those given by Mr Yarrell, who, however, does not inform us as to the country of his specimens, and by M. Temminck, who among his synonyms makes no reference to the American birds.

Habits.—This species is said by authors to inhabit the northern parts of Europe, and to extend in diminished numbers as far south as France, Switzerland, and Italy. A very few individuals have been met with in England. Mr Selby, as already mentioned, procured one shot in Northumberland, and Mr Yarrell states that in 1836 "a recently shot specimen was purchased in a poulterer's shop in London; and in May of the same year, Mr John Leadbeater of Brewer Street received a specimen for preservation which had been shot in Kent." M. Temminck says it nestles in the natural holes of pines, laying two pure white eggs; and feeds on mice, moths, beetles, and other insects, as well as sometimes on birds. In North America, according to Dr Richardson, it appears to inhabit all the wooded country from Great Slave Lake to the United States,

and is very common on the banks of the Saskatchewan. He informs us that it is strictly nocturnal, and "when it accidentally wanders abroad in the day, is so much dazzled by the light of the sun as to become stupid, and it may then be easily caught by the hand. Its cry in the night is a single melancholy note, repeated at intervals of a minute or two." Mr Hutchison states that it builds a nest of grass, halfway up a pine tree, and lays two white eggs.

Remarks.—This species is undoubtedly in all essential respects so similar to the Tawny Owl, that there can be no reasonable question as to the propriety of referring it to the same genus. Yet our most recent authors have thought otherwise. Thus, Mr Yarrell refers the Tawny Owl to the genus Syrnium, which he places between Strix and Surnia, of which the Barn Owl and Snowy Owl are typical, while Tengmalm's Owl is referred to the same genus (Noctua) as the Passerine Owl, from which it differs entirely in the form and size of the ear, which in the latter is small and destitute of operculum, whereas in the former it is very large, and has a distinct anterior semicircular operculum extended along its whole length.

Cuv.
Otus. Hibou.

Genus ~~VI~~ V. ~~ASIO. TUFTED-OWL.~~

Although furnished with tufts of feathers on the head, the birds of this genus are distinguished from those on which the generic appellation of Bubo has been bestowed, by the enormous size of their auditory concha, more elongated wings, and other peculiarities.

Bill short, moderately strong, compressed toward the end: upper mandible with the dorsal line decurved from the base, at first slightly, the ridge broad on the cere, which is large, narrowed anteriorly, convex in its whole length, the sides convex toward the end, the edges soft as far as the nostrils, then sharp, direct, and decurved, the tip acute and descending obliquely; lower mandible with the crura narrow, the angle wide, the dorsal outline very short, slightly convex, the back and sides rounded, the edges toward the end sharp, inflected, decurved, with a slight sinus on each side close to the obliquely truncate tip.

Mouth very wide; palate prominent, sloping upwards at the sides, with two lateral soft ridges, and an anterior elevated central line running to the mandible; posterior aperture of the nares narrowly elliptical, with an anterior fissure. Tongue short, narrow, fleshy, oblong, deeply emarginate and papillate at the base, its upper surface with a median groove, its tip thin, and emarginate. Œsophagus very wide, of nearly equal diameter throughout; proventricular glandules small and cylindrical. Stomach large, roundish, its muscular coat very thin, being composed of a single series of distinct fasciculi, the central tendons thin and roundish; the epithelium thin, soft, and somewhat rugous. Pylorus closed by a thin margin. Intestine of moderate length and width; cœca of considerable length, oblong, contracted toward the base; rectum dilated into a very large oblong cloaca.

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Nostrils large, medial, lateral, oblong, oblique. Eyes very large, obliquely placed; eyelids with broad crenate thin margins, and ciliary fringes of small feathers having distant filaments. Conch of the ear extremely large, extending from over the middle of the eye to the base of the lower mandible, and of a curved elliptical or semilunar form, with an anterior semicircular flap or operculum in its whole length, and a broad membranous margin behind, both beset with recurved feathers. The aperture of the meatus elliptical, in the lower part of the conch, bounded anteriorly by the eye, above by a ligament stretching to the operculum, and behind by a ligament extended along the edge of the temporal bone. Above the meatus is a deep depression, above which another ligament passes to the operculum.

Head very large, short, somewhat triangular, with the sides flattened and sloping forwards. Neck short; body short, deeper than broad, much compressed behind. Legs short, moderately stout; tibia muscular; tarsus short, and with the toes covered with soft somewhat silky feathers, having the filaments disunited. First toe very short, with much lateral motion; the fourth next in length, the third longest; all with two terminal scutella. Claws long, moderately curved, slender, tapering, extremely acute, compressed, with the sides convex; the lower surface of the first rounded, of the second and fourth narrow, flattened or slightly grooved; the third with a dilated inner edge.

Plumage full, and extremely soft. Facial disks very large, complete, composed of linear-oblong softish loosely-barbed feathers. The ruff complete, and composed of oblong, compact, but very soft, recurved feathers. Bill partially concealed by bristly feathers directed forwards; cere bare above. A tuft of elongated feathers on each side over the eye. The feathers in general oblong, rounded, loosely margined, almost downy; those of the abdomen downy; of the feet soft and glossy. Wings very long, broad, and rather pointed; primary quills broad and rounded; the second longest, the first and fourth about equal, the first only having a slight sinus in the inner web close to the tip; its outer barbs free and recurvate, as are

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those of part of the second. Tail rather short, slightly arched, of twelve broad, rounded, weak-shafted feathers.

The species of this genus seem to be those to which the Circi are most nearly allied. In external aspect they approach the genus Bubo, but are less robust. They also bear a considerable resemblance to the Hooting Owls, but have the head much smaller, and its fore part more narrowed by the large disks, which almost meet upon it, as in the genus Strix. Their habits are nocturnal; but they are capable of flying by day. Two species occur in Britain, one of them the most common of all our Owls, with the exception of Strix flammea.



Fig. 246.

1. Otus vulgaris. Flem. Long-eared Hibou.

~~ASI OTUS. THE MOTTLED TUFTED-OWL.~~

LONG-EARED OWL. COMMON EARED OWL. HORNED OWL.

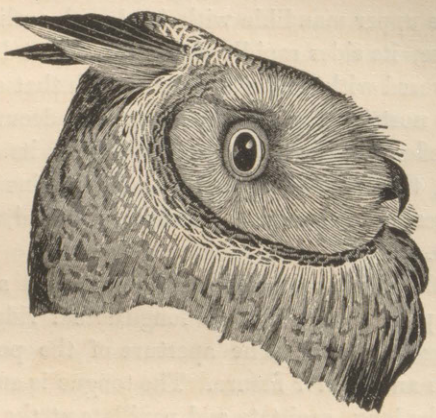


FIG. 247.

Strix Otus. Linn. Syst. Nat. I. 132.
Strix Otus. Lath. Ind. Orn. I. 53.
Long-eared Owl. Mont. Orn. Dict.
Hibou Moyen Duc. Strix Otus. Temm. Man. d'Orn. 102.
Long-eared Owl. Otus vulgaris. Selb. Illustr. I. 85.
Otus vulgaris. Long-eared Owl. Jen. Brit. Vert. An. 91.

Tufts conspicuous, projecting an inch and a half beyond the plumage of the head; upper parts light reddish-yellow, longitudinally streaked, transversely barred, finely undulated with brown and greyish-white; lower parts light reddish-yellow, with oblong brown streaks, and faintly undulated; facial disks whitish in their anterior half, pale yellowish-brown behind, the eye half surrounded by dark brown. Young with the facial disks yellowish-brown, and the dark markings on the lower parts broader.

Male.—This Owl, which is one of our most common species, is readily distinguishable by the elongated tufts of feathers on its head, taken in connection with its size, which is about that of the Barn or White Owl, and the minutely mottled colouring of its upper parts. Although apparently robust, owing to the great bulk of its plumage, its body is but small and its neck slender. The head is very large and somewhat triangular; the bill short, of moderate strength, and considerably compressed; the upper mandible with its dorsal outline decurved from the base, its sides rapidly sloping and but little convex, its edges covered with skin, continuous with that of the palate, as far as the nostrils, then direct, sharp, and decurved; the tip acute and deflected; the lower mandible with its crura narrow and flexible, the angle elongated, the dorsal line slightly convex, the edges inflected, the tip abruptly rounded, with a sinus on each side.

The mouth is very wide, measuring an inch and a twelfth across; the palate flat, with two longitudinal ridges, and the sides sloping upwards. The aperture of the posterior nares oblong, with an anterior fissure. The tongue is small, narrow, seven-twelfths long, sagittate and papillate at the base, its tip thin and bifid. The œsophagus is five inches and a quarter long, of nearly uniform width, measuring about an inch across when inflated. The proventricular glandules, which are large and very distinct, form a belt three-fourths of an inch in breadth. The stomach is large, thin, round, a little flattened, an inch and three-fourths in diameter; the fibres of its muscular coat rather coarse, the tendinous spaces circular, and about half an inch in diameter; the epithelium soft and rugous. The intestine measures twenty-two inches in length, from three-twelfths to a twelfth and a half in width; but in the rectum, which is two and a half inches long, becomes wider, and expands into an extremely large ovate cloaca, an inch in width. The cœca are two inches and three-fourths in length, for an inch and a half only one-twelfth in width, then enlarging into an oblong sac, of which the greatest breadth is half an inch.

The nostrils are large, oblique, oblong, in the fore part of the cere, and having internally a ridge curved backwards from

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the inner edge. The eyes are very large; the eyelids, which are equally mobile, with broad, thin, crenate margins, and ciliary fringes of distantly barbed feathers. The conch of the ear extends in a semilunar form from over the eye to the base of the lower mandible; its posterior elevated margin three inches in length, its anterior raised into a semicircular flap or operculum, beset with recurved feathers. The tarsi are short and rather stout; the toes also short, and feathered; the outer two connected by a short basal web; the first very short, the second and fourth nearly equal, all with two terminal scutella. Claws long, tapering to a very fine point, curved in the fourth of a circle, compressed but convex on the sides, the first and second rounded beneath; the inner two much smaller.

The plumage is extremely soft; the feathers generally oblong. The facial disks, which are large and complete, are composed of circular series of weak, slender, slightly recurved feathers, having distant filaments. The ruff also is complete, its feathers oblong and recurved. The disks meet at the base of the upper mandible, where the feathers are more bristly. The wings are long, and of great breadth; the primary quills very broad, with slender shafts, the outer a little incurved toward the end; the second longest, the first nearly an inch shorter; the secondary quills fifteen, broad and rounded. The first quill with a sinus near the tip of the inner web, and the barbs of the outer web free and recurved at the end in its whole length; those of the second toward the end also recurved, as is the case with the first alular feather. The tail is rather short, slightly arched, a little rounded, the lateral feathers being somewhat more than half an inch shorter.

The bill is brownish-black, the cere flesh-coloured, as is the inside of the mouth. The irides are orange; the claws brownish-black; at the base tinged with grey. The ground colour of the plumage is buff or reddish-yellow. The upper part of the head minutely mottled with whitish, brownish-black, and light-red; the two elongated tufts, of which the largest feathers are an inch and a half in length, are light reddish towards the base, brownish-black in the central part to the

end, their inner edge white, mottled with dark-brown. The rest of the upper parts may be described as longitudinally streaked with dark brown, barred and finely undulated with the same, and with greyish-white. The first row of coverts is tipped with white on the outer web; and the edge of the wing, and the outer margin of the first alular feathers are of the same colour. The alula and primary coverts are greyish-brown, barred with darker; the quills and scapulars pale grey, barred with dark brown, and having more or less buff toward the base of the outer web, that colour being conspicuous on the outer six primaries. The tail is barred and dotted in the same manner; the dusky bars narrow, eight or ten in number. The facial disk is white anteriorly, with the tips black, reddish-yellow behind; and the feathers on the upper eyelid are black. The ruff is reddish, mottled with black. The lower parts are in general similar to the upper, but with more buff, and fewer spots, each feather with a linear-oblong dark-brown streak, and several irregular transverse bars. The feathers of the tibiæ, tarsi, and toes are pure buff. The lower wing-coverts are light buff; the primary coverts white, largely tipped with dark-brown; the quills yellowish-white, banded with brown toward the end.

Length to end of tail 14½ inches, to end of wings 15½; extent of wings 36; bill along the ridge $1\frac{5}{12}$, along the edge of lower mandible $1\frac{5}{12}$; wing from flexure 11½; tail 5¾; tarsus 1½; first toe ½, its claw $\frac{8}{12}$; second toe 1, its claw $\frac{9}{12}$; third toe 1¼, its claw $\frac{9\frac{1}{2}}{12}$; fourth toe ¾, its claw $\frac{7}{12}$.

Female.—The female, which is considerably larger, has the upper parts lighter, but in other respects is similar in colouring.

Length to end of tail 16 inches, to end of wings 17; extent of wings 40; bill along the ridge 1¼; wing from flexure 12; tail 5¾; tarsus $1\frac{7}{12}$; hind toe $\frac{}{12}$, its claw $\frac{8}{12}$; middle toe 1¼, its claw $\frac{9}{12}$.

Variations.—This species exhibits little variation in its colours, some individuals merely having more grey than others

on the upper parts, and the buff of the lower being more or less intense. The intestinal canal varies a few inches in length, and the cœca are very seldom equal.

Habits.—This Owl is a constant resident, and occurs in most of the wooded districts of England and Scotland. Next to the Barn Owl, it is our most common species, although not of frequent occurrence in any part of the country. It is strictly nocturnal, coming abroad in the evening, and resting by day in woods and thickets. The first individual which I ever saw alive, I shot in a small wood of pinus sylvestris, near Elgin, to which I was directed by Mr Barclay of Calcoats. It was reposing on one of the higher branches of a tall tree, and allowed me to approach within forty yards. The food of this species consists of small glires, moles, and birds, as well as insects. If disturbed by day, it flies in a buoyant but rather slow and wavering manner; but of its nocturnal flight I am unable to speak. It generally appropriates the deserted nest of a rook or other large bird, but sometimes forms one for itself, and lays from three to five eggs, which are elliptical, an inch and nine twelfths in length, an inch and four twelfths in breadth, smooth, and of a pure white colour. The young, which are hatched in the beginning of May, are at first covered with down, not white as some have stated, but of a light yellowish-grey tint, barred with faint brown, and have two conspicuous tufts on the head. They frequently emit a loud rather shrill cry, and even when they have come abroad in June, continue for some weeks to importune their parents for food in the same manner. The old birds at night occasionally emit a plaintive cry.

"The Long-tufted Owl," Mr Hepburn informs me, "is rather a common species in East Lothian, roosting and nestling in our dark pine woods. Sol will sometimes surprise the nocturnal wanderer, feasting on his prey in the meadow. He seeks the friendly shelter of the hedgerow or neighbouring wood, where he hopes to remain in peace until night again throws her veil over nature. Vain are his hopes, for a prying wren has discovered the intruder, and sounds an alarm. The robin, the white-throat, the chanter, and other birds hasten to the spot. First

and foremost are the chaffinches. They buffet him, peck at, and menace him on every side, while the Owl turns his eyes from party to party, evading their blows as well as he can. The uproar is now great, each bird in his mother-tongue venting execrations against the poor Owl. On such occasions one may get within a few feet of it, the distance varying according to the depth of shade in which he may be sitting. At length he takes wing, generally flies a short distance, often pursued by a chaffinch or two. On alighting he is still persecuted; and unless he gain some suitable roosting place among the fir-trees, the alarm-notes of these watchful birds are heard the live-long day.

"I have seldom seen it hunting for prey before it is quite dusk. I have known it occupy the deserted nest of the wood-pigeon and the carrion crow, merely adding a few sticks and wool. Indeed it seldom makes a nest for itself. The young, usually four or five, are hatched in the beginning of May. Its cry, consisting of two or three notes, is plaintive; I have often heard it when walking through our woods at night. Its food consists of small quadrupeds, as well as of beetles in their season."

An individual of this species, which was sent to me in winter by the Rev. Mr Adam, having been left at night perched on the back of a chair in my drawing-room, tore to tatters six valuable skins of birds from the Rocky Mountains, and an equal number of nearly equally rare specimens from India. A young bird which I kept for some time, on perching, stood at first with the body inclined, afterwards nearly erect, and slept in the latter posture, with its neck rather extended, its feathers drawn close, and its tufts recumbent. When irritated it raised its plumage, threw its body forward, and uttered a sharp cry. It seized its food with its bill; if large transferred it to one of its feet, but if otherwise retained it in his bill. In flying, it carried a small object in its bill, but a larger in its foot. It could close one eye, while the other remained open, and when placed in a strong light, frequently drew the membrane over the lighted eye, while the other remained unsheathed, though for the most part it winked with both simultaneously. The irides contracted unequally, according to the degree of light.

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When perched at night it sometimes emitted a clicking noise, like that of a spring, with its bill; but when provoked, it neither hissed nor snapped, but uttered a shrill, tremulous, plaintive cry, or succession of short notes, erecting its tufts at the same time.

On the European Continent this species extends from the Scandinavian Peninsula to the shores of the Mediterranean. It has also been found in Africa. In North America it is very extensively dispersed, but, according to Mr Audubon is more abundant in the middle and eastern than in the southern and western parts. Its habits there, as described by him, are the same as with us. "During the day it is not uncommon to see it perched on the top of a low bush or fir. At such times it stands with the body erect, but the tarsi bent and resting on a branch, as is the manner of almost all Owls. The head then seems the largest part, the body being much more slender than it is usually represented. Now and then it raises itself and stands with its legs and neck extended, as if the better to mark the approach of an intruder. Its eyes, which were closed when it was first observed, are opened on the least noise, and it seems to squint at you in a most grotesque manner, although it is not difficult to approach very near it. It rarely on such occasions takes to wing, but throws itself into the thicket, and makes off on foot by means of pretty long leaps. When encamped in the woods, I have frequently heard the notes of this bird at night. Its cry is prolonged and plaintive, though consisting of not more than two or three notes repeated at intervals. Its food consists of rats, mice, and other small quadrupeds, as well as birds of various species; its stomach having been found by me crammed with feathers and other remains of the latter."

But the Prince of Musignano, holds the American Long-eared Owl to be distinct from the European, and in his Comparative List has named the former Otus Americanus, the latter Otus vulgaris. As no reasons are assigned, and as I have compared skins and recent birds from both countries, I take leave to deny the accuracy of this statement.

Young.—When completely fledged, the young are coloured like their parents, but with the tints much deeper, and the dark markings broader. The iris is orange; the bill brownish-grey, at the tip greyish-yellow; the claws greyish-brown. The facial disks are yellowish-brown; the bars on the wings and tail are more strongly marked, and the reddish-yellow on the six outer quills is of a richer tint.

Progress toward Maturity.—After the first moult the dark markings are still considerably broader than in the adult, and the lower parts more barred. In old individuals, the lower parts are pure buff, with narrow longitudinal spots only, the transverse bars having disappeared.

Otus — The Short-eared Hibou.

2. ~~ASIO~~ BRACHYOTUS. ~~THE STREAKED TUFTED-OWL.~~

SHORT-EARED OWL. HAWK OWL. WOODCOCK OWL. MOUSE-HAWK.

Strix Ulula. Lath. Ind. Orn. I. 60.
Strix brachyotos. Lath. Ind. Orn. I. 55.
Short-eared Owl. Mont. Orn. Dict.
Hibou brachiote. Strix brachyotus. Temm. Man. d'Orn. I. 99.
Short-eared Owl. Otus Brachyotos. Selb. Illustr. I. 88.
Otus brachyotos. Short-eared Owl. Jen. Brit. Vert. An. 92.

Tufts inconspicuous, projecting about half an inch beyond the plumage of the head; upper parts light reddish-yellow, with broad longitudinal streaks and transverse bars of deep brown; lower parts light reddish-yellow, with narrow longitudinal brown streaks; facial disk whitish in its anterior half, pale yellowish-brown behind, the eye completely surrounded with brownish-black; middle tail-feathers with a brown central patch in each of the light-coloured spaces between the dark bands. Young similar to the adult.

Male.—This species closely resembles that already described, being of nearly the same size, and agreeing in the tints of its plumage, but is easily distinguished by attending to its peculiar markings, independently of the less elongated tufts on its head. Although seemingly robust, when covered with feathers, its body on being denuded is found to measure only two inches and a quarter in its greatest depth, two inches in its greatest breadth, and to be so much compressed behind as to measure no more than ten twelfths in the abdominal region. The head is very large, and somewhat triangular; but it is proportionally smaller than that of any other of our Owls. The bill is short, moderately stout, and considerably compressed; the upper mandible with its dorsal outline decurved from the base, bulging a little on the cere, the sides sloping and but little convex, the edges soft as far as the nostrils, then direct, sharp, and

decurved, the tip acute and deflected; the lower mandible with its crura narrow and flexible, the angle wide and elongated, the dorsal line short and convex, the edges inflected, the tip obliquely truncate, with a slight sinus on each side.

The mouth is very wide, measuring an inch and a twelfth across; the palate flat, with two longitudinal ridges, and the sides sloping upwards; the aperture of the posterior nares narrowly elliptical, with an anterior fissure. The tongue is small, narrow, seven-twelfths long, sagittate and papillate at the base, bristly on the sides, its tip thin and slightly bifid. The œsophagus is five inches in length, of the nearly uniform width of four and a half twelfths when contracted, and of ten-twelfths when inflated. The proventricular glandules, which are rather large, form a belt about eight-twelfths in breadth. The stomach is nearly globular, two inches and two-twelfths long, two inches in breadth, and an inch and a quarter across; its muscular coat thin, being composed of a single series of rather coarse fasciculi: its tendons about four-twelfths in diameter, the epithelium soft, thin, and longitudinally rugous. The pylorus is extremely narrow, and closed by a thin margin. The intestine is twenty-two inches long, from five-twelfths in width to a twelfth and a half; the rectum three inches long, for an inch and a half of its length three-twelfths in diameter, then enlarged into a globular cloaca, an inch in width. The cœca are three inches and two-twelfths long, for two inches narrow, having a breadth of only one-twelfth, then expanded into an oblong sac, of which the greatest breadth is five-twelfths.

The nostrils are large, oblong, oblique, in the fore part of the cere. The eyes very large; the eyelids with broad thin crenate margins, and ciliary fringes of small distantly barbed feathers. The tarsi are short and rather stout; the toes also short, and feathered; the first shortest, the third longest, the second considerably longer than the fourth; two terminal scutella on the hind toe, three on the rest. The claws are long, slightly arched, tapering, extremely acute, compressed, the first and second narrow and rounded beneath; that of the fourth toe smallest, of the first a little larger, those of the other toes much larger and nearly equal.

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The plumage is extremely soft and blended, although somewhat firmer than that of the other species. The facial disks are complete, and composed of circular series of weak, slender, slightly recurved feathers having distant filaments. The ruff is also complete, and composed of oblong, recurved, compact feathers. The cere is bare above, but it and part of the bill are concealed by bristly feathers. On the upper parts the feathers are oblong; those on the hind part of the back entirely downy; on the lower parts also oblong, and mostly downy; on the tibiæ short, extremely soft, and somewhat silky; on the tarsi and toes small, soft, and blended. The wings are long, broad, and somewhat rounded; the primary quills very broad, with slender shafts; the first sinuate on the inner web, the second faintly so; the second longest, the third scarcely shorter, the first a little longer than the fourth; the secondary quills fifteen, broad and rounded; the first primary in its whole length, the second towards the end, and the first alular feather, with their external barbs disunited and recurved at their points. The tail is rather short, slightly arched, somewhat rounded.

The bill is brownish-black; the cere flesh-coloured; the irides bright yellow; the claws brownish-black, tinged with grey. The anterior half of the facial disk is white, the feathers with black tips; the posterior yellowish with black shafts; and the eye is surrounded by a ring of brownish-black, which is much broader behind. The ruff-feathers are yellowish, with an oblong brownish-black spot. The upper part of the head, hind-neck, and fore part of the back, are reddish-yellow, with the central part of each feather dark-brown. The scapulars and wing-coverts are spotted and banded in large patches with the same colour, many of them having also a large yellowish-white spot on the outer web near the end. The edge of the wing is whitish; the alula and primary coverts dark brown, the outer webs pale buff at the base; the quills buff, with a narrow space along the shafts, the ends, and two or three broad bands, dark brown. The tail is buff, with five broad bands of brown, the tip yellowish-white: the two middle feathers with the light-coloured spaces ocellate, having a brown patch in the middle. The lower parts are pale buff, whitish behind; the

besides in imper- ect bars the bars more distinct on the middle feathers.

neck with oblong, the breast and sides with linear dark-brown markings; the upper part of the throat, the abdomen, lower tail-coverts, legs and feet without spots. The lower surface of the wing is yellowish-white; some of the coverts with a brown spot; the quills broadly banded with dusky toward the end.

Length to end of tail 15 inches; to end of wings 17; extent of wings 38; bill along the ridge $1\frac{5}{12}$; along the edge of lower mandible $1\frac{5}{12}$; wing from flexure $11\frac{3}{4}$; tail $6\frac{1}{2}$; tarsus $1\frac{7}{12}$; first toe $\frac{7}{12}$, its claw $\frac{8}{12}$; second toe $1\frac{1}{12}$, its claw $\frac{10}{12}$; third toe $1\frac{5}{12}$, its claw $\frac{9}{12}$; fourth toe $\frac{8}{12}$, its claw $\frac{8\frac{1}{2}}{12}$.

Female.—The female is considerably larger than the male, but similar in colouring, the upper parts have their brown markings lighter, the lower parts of a richer tint, and with broader streaks. The œsophagus five and a half twelfths long, nearly an inch in width when inflated. The stomach two inches and a quarter in diameter. The intestine twenty-three inches and a half in length, from four twelfths to two twelfths in width; the rectum wide, its dilatation globular. The cœca two inches and three fourths in length; the greatest width half an inch, the smallest nearly one twelfth.

Length to end of tail 16 inches, to end of wings 18; extent of wings 40.

Variations.—Individuals vary in the tints of their plumage, the ground colour being yellowish-red, buff, or yellowish-white; but the differences are not very remarkable.

Habits.—This species may be considered as permanently resident in Britain; for although towards the end of October there is an immigration from the north, and in spring a corresponding diminution takes place, yet many individuals breed in the country. It is by no means an extremely rare bird; but probably the circumstance of its residing in exposed places renders it more easily detected, which may be the reason why more specimens should be obtained of it than of any other, in proportion to their respective numbers. In winter it is dispersed over the country from the northern parts of Scotland to the

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southern counties of England. Although often raised by sportsmen and others, it is not certain that it usually hunts during the day. It is found in stubble fields, or among turnips, by the side of a hedge, or on the grassy margin of a brook or ditch, where it rests in an erect posture. On being disturbed, it flies off in an undulating manner, with a buoyant flight, shooting away in various directions, and inclining its body alternately to either side, much in the manner of the smaller gulls. After proceeding some hundred yards, it generally alights, when a person may get within shot, although it does not allow so near an approach as most other species.

Bewick having mentioned the occurrence of twenty-eight in a turnip field in November, Montagu thinks that the circumstance of its being thus occasionally gregarious may be accounted for by the abundance of food in a particular place. "Mr Austin assures us that a few years since, mice were in such vast abundance as to destroy a large portion of vegetation in the neighbourhood of Bridgewater; and in autumn a great many of the Short-eared Owls resorted to that part in order to prey on them. They were found in the fields amongst the high grass."

In December 1835, I came upon one standing by the side of a ditch, about a mile from Edinburgh. On my approach it flew off, and although shot at, without being wounded however, alighted at the distance of about two hundred yards, by the edge of a turnip field. Before I got half way to its new station, it rose, ascended to a considerable height, and hovered about, very much in the manner of a gull. A rook presently made up to it, and endeavoured to peck at it, but the owl took care to keep beyond reach, by rising in a spiral direction. It was then attacked by another rook, and afterwards by two more; but it still kept above them, and continued to ascend until it gained a great elevation, when they left it one by one. After sailing a long time in circles, it flew off to a great distance. It was a clear sunny day; yet the owl seemed in no degree incommoded by the light.

Montagu states that "the Short-eared Owl comes to us in October, about the time the Woodcock makes it appearance,

and departs at the same time with that bird, in March ; whence its name of Woodcock Owl. With us this bird is observed never to perch on a tree, but generally hides itself in long grass, fern, or the like ; and seems partial to open, barren situations. When disturbed it flies a little way, and lights again on the ground. In dusky weather it will prey by day, and sometimes fly at small birds as well as mice. It is a bold bird, but seems contented in confinement. One which was taken in a lark-net became tolerably tame in a few months, and when hungry would take food from the hand. It was mostly fed with small birds and mice, but would eat any raw meat, which it first took in its bill, and immediately placed in its talons, and devoured it by piecemeal. When it was asleep or undisturbed the aurated feathers were very distinguishable, standing above the rest about half an inch ; but on its being disturbed they were instantly depressed, and the head apparently enlarged by the feathers round the face being somewhat raised."

Since Montagu's time, however, it has been found breeding in England. The late Mr Hoy, an enthusiastic observer of birds, says in Mr Loudon's Magazine, " I am acquainted with two localities in the south-western part of Norfolk, where pairs of this bird breed ; and I have known several instances of their eggs and young being found. One situation is on a dry heathy soil, the nest placed on the ground amongst high heath ; the other in low fenny ground, among sedge and rushes." Sir William Jardine has also found it breeding in Dumfriesshire. Two nests which he discovered on an upland moor, and which contained five eggs, " were formed upon the ground among the heath ; the bottom of the nest scraped until the fresh earth appeared, on which the eggs were placed, without any lining or other accessory covering. When approaching the nest or young, the old birds fly or hover around, uttering a shrill cry, and snapping with their bills. They will then alight at a short distance, survey the aggressor, and again resume their flight and cries. The young are barely able to fly by the 12th of August, and appear to leave the nest some time before they are able to rise from the ground." Mr Low, in his Fauna Orcadensis, says, " It is very frequent in the hills of Hoy, and

Short-eared Owl.

builds its nest among the heath. It is impudent in breeding-time, sometimes catching up chickens from the doors. I have likewise seen it in chase of pigeons in daylight, which is not ordinary with the owl kind. In a nest I found in Hoy were the remains of a moorfowl, two plovers, besides the feet of several others, and the birds, two in number, ready to fly. The nest was in a large heath-bush, made without any art; intolerably fetid, by reason of the heat of the weather, which had putrified some part of the provisions; and which was still increased by the dung of the birds, which the parents did not seem so attentive to remove as I have observed the smaller birds upon such occasions." It is very remarkable that a bird of so small muscular development should be able to kill and carry off a red grouse, the weight of which is more than double its own; but Mr Low could not have been mistaken, as he describes the bird with accuracy.

The ordinary food of this species consists of small quadrupeds and birds. It is generally distributed on the continent of Europe, and has been found in some parts of Asia and Africa. It is also extensively distributed in America, being plentiful to the north of the St Lawrence in summer, and extending in winter southward as far as Florida. Having compared American skins and recent specimens with European individuals, I feel assured that the Short-eared Owl of Wilson, Richardson, and Audubon, is the same as ours. Its habits, as described by Mr Audubon, are similar to those of our bird. He found it plentiful in Florida, during winter, where he was "surprised to see the great number which at that period were to be found in the open prairies, rising from the tall grass in a hurried manner, and zig-zagging for a few yards, as if suddenly wakened from sound sleep, then sailing to some distance in a direct course, and dropping among the thickest herbage. On being pursued and repeatedly started from the ground, those birds extended their flight so far as to be quite out of sight before alighting. I never started two birds at once, but always found them singly at distances of from twenty to thirty yards; and although on several occasions as many as three were seen on wing, they having been put up by my companions and myself, they

never flew towards each other, but went off in different directions, as if unaware of each other's presence. Its predilection for the ground forms a very distinctive peculiarity in the habits of this owl, as compared with the Long-eared; for, although it alights on bushes and trees, this seems more a matter of necessity than of choice. The only nest of this bird that I have found, contained four eggs, of a dull bluish-white, and of a somewhat elongated or elliptical form, an inch and a half in length, and an inch and an eighth in breadth. The nest, which was placed under a low bush, and covered over by tall grass, through which a path had been made by the bird, was formed of dry grass, raked together in a slovenly manner, and quite flat, but covering a large space, on one side of which were found many pellets and two field-mice. On examining the pellets I found them to be formed of the remains of bones of small quadrupeds, mixed with hair, and the elytra of various coleopterous insects. In its diurnal flight, the flappings of its wings are noiseless, as in most other species, and it is apt to sail many yards before alighting. Like the rest of the family, when reposing, they stand as if crouched on the full length of their tarsi, and the slight crests or tufts of feathers on their head are, on such occasions, usually so lowered as to be scarcely perceptible."

The substances which I have found in the stomach, were remains of field-mice, and small birds. Montagu found in the stomach of one the fragments of a sky-lark and a yellow-hammer. The male above described, which was shot in January 1836, contained four heads of mice, with a great quantity of hair and bones. One examined by Mr Harley, at Leicester, on the 1st November 1839, contained "the entire hind foot of a field-mouse and numerous small bones, likewise a great quantity of fur, but no remains of beetles. This individual weighed 14 oz, and measured in length 15 inches, in extent of wings 40¼." Mr Hepburn says, "one that I examined was shot at Tyningham, the noble seat of the Earl of Haddington, on the 27th of May 1838. The contents of its stomach were mice and coleoptera. On the 29th July 1839, I examined two newly fledged Short-tufted Owls, shot in the morning of that day in the Birks Wood in the parish of Whittingham."

Genus VII. STRIX. SCREECH-OWL.

The genus Strix, of which the Barn Owl of Europe, Strix flammea, and the American Screech-Owl, Strix Americana, are characteristic species, is distinguished from the other genera by peculiarities which are obvious to the most superficial observer, and which may readily be selected from among those constituting the following generic description.

Bill short, of moderate strength, compressed toward the end: upper mandible with the dorsal outline straight to the edge of the cere, then decurved in the fourth of a circle, the ridge broad at the base, narrowed and convex anteriorly, the sides convex toward the end, the edges soft until nearly opposite the nostrils, where they are a little inflected, then sharp and direct to the end, the tip acute and decurved over that of the lower mandible; which is straight, with the crura narrow and flexile; the angle long, the dorsal line short, ascending and somewhat convex, the back and sides convex, the edges soft until near the end, when they become sharp, inflected, and curve downwards, forming on each side a small sinus, close to the rounded tip; the gape-line slightly sinuous.

The mouth is very wide; the palate concave in the middle, sloping upwards at the sides, with two longitudinal papillate ridges, and an anterior median tuberculate ridge. Posterior aperture of the nares elliptical with an anterior slit, the margins of which and the space between it and the ridges are covered with minute papillæ directed backwards. Tongue narrow, fleshy, sagittate and papillate at the base, one of the papillæ on each side being much larger, the sides nearly parallel, the upper surface flattened, with a median groove, the tip thin, bifid, with two pointed lobes, a small portion beneath horny, with a median groove. Œsophagus very wide, of uniform diameter; proventricular glands forming a continuous broad belt. Sto-

mach very large, roundish, a little compressed; its muscular coat very thin, and composed of a single series of coarse fasciculi; the central tendons thin and small, the inner coat very thin, perfectly smooth, and even. Pylorus very small, closed by a rim, or having one triangular prominence. Intestine of moderate length, narrow, contracting toward the cœca; which are long, of the same diameter at the base as the intestine, gradually enlarge, and terminate in an oblong extremity; cloacal dilatation extremely large and globular.

Nostrils medial, large, ovate, oblique, in the anterior edge of the cere. Eyes very large, slightly mobile, obliquely situated; eyelids with ciliary fringes of small feathers having distant filaments, and broad, thin, crenate margins, which are discontinued at the two canthi or angles; both eyelids equally mobile. Aperture of the ear, properly so called, large, subrectangular, oblique, with an upper and a lower somewhat elevated margin, and an anterior operculum, which is large, erect, somewhat semicircular, subtruncate, and beset with feathers. Conch extremely large, semicircular, extending from over the anterior angle of the eye to the middle of the lower jaw; its surface sparsely covered with long, slender feathers, of which the basal half is destitute of filaments.

Head extremely large, broad behind, somewhat trigonal, with the sides flattened and sloping forwards. When the feathers are removed the skull is found to be more elongated than in the other genera, its anterior part remarkably spongy, so that the septum between the orbits is of great thickness. The neck is as thick as the head, and exceeds in this respect the greater part of the body; but on being denuded is found to be slender. The body also is slender, deeper than broad, and much compressed behind. Legs rather long, of moderate strength; tibia longish and muscular; tarsi of moderate length, covered with small downy feathers; toes short, covered above with transverse series of small scales, together with adpressed shaft-bristles, and two or three large terminal scutella, beneath padded and covered with flattened papillæ; the third and fourth connected by a very small basal membrane; the first very short, the third longest, but not much exceeding the second

which is considerably longer than the fourth. Claws long, moderately curved, tapering, extremely acute, rounded above, convex laterally, very narrow and grooved beneath, that of the second toe longest, the inner dilated thin edge of the third cut transversely or serrated.

Plumage extremely full, soft, and downy. Two very large, complete, facial disks, composed of circular series of slender, slightly recurved feathers, having distant filaments. Cere covered on the sides with bristles concealing the nostrils. Margining the conch externally is a beautiful and perfect ruff, of several series of linear-oblong curved feathers, having the filaments loose, unless toward the end. The feathers of the narrow frontal space are concealed by those of the disks and ruff. The feathers in general are oblong, elongated, very downy; on the wings shorter and more compact; on the tarsi very short and downy, on the toes generally reduced to the shafts. Wings long, very broad, of twenty-five quills, which are rounded, and all entire on the margins; the outer with the external filaments free and recurved, the second longest, the first and third slightly shorter. Tail short, decurved, even, of twelve broad, rounded, rather weak feathers.

The extreme lightness of the birds of this genus compared with their bulk, renders their flight in the highest degree buoyant, insomuch that it assumes a character of unsteadiness. In descending upon their prey, they must employ a mode considerably different from that of the heavy-bodied Falcons, which drop headlong almost with the velocity of a stone. The softness of their plumage renders their flight noiseless, and they are thus enabled to steal unawares upon the quarry until within a distance at which they can pounce with certainty. It is perhaps owing to this circumstance that the tails of owls in general are very short and narrow compared with those of Hawks, which, having a more rapid flight, and being heavier, require an instrument to enable them to perform sudden deviations, and to break their fall, when they come upon their prey. The Screech-Owls have, when at rest, an amusing aspect of gravity, which degenerates into grotesqueness when apprehension of danger or curiosity induces them to examine the approaching

observer; the extreme mobility of their neck enabling them to throw themselves into various postures with ease. Although it appears that they can see by day sufficiently well to enable them to find their way, it is not until toward evening that they sally forth in quest of food. They nestle in buildings, rocks, and other high places, as well as on the ground. The eggs, two or three in number, are elliptical or oval, being more elongated than in the other genera. Only one species occurs in Britain, where it is generally distributed.

Fig. 248 represents more especially the external ear of the Screech-Owl. Fig. 249 shews its foot, and more particularly the serrated claw. This figure is of the full size; the other reduced.

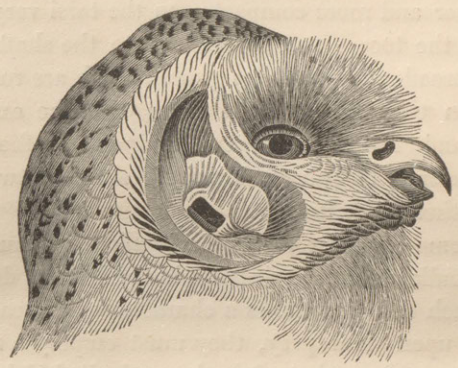


Fig. 248.



Fig. 249.

STRIX FLAMMEA. *Linn.* THE EUROPEAN SCREECH-OWL.

BARN OWL. CHURCH OWL. SCREECH OWL. HISSING OWL. WHITE OWL. YELLOW OWL. GILLIHOWTER. HOWLET. HOOLET. CAILLACH-OIDHCHE-GHEAL.

Strix flammea. Linn. Syst. Nat. I. 133.
Strix flammea. Lath. Ind. Orn. I. 60.
Barn Owl. Mont. Orn. Dict.
Chouette Effraie. Strix flammea. Temm. Man. d'Orn. I. 91; II. 48.
Barn or White Owl. Strix flammea. Selb. Illustr. I. 99.
Strix flammea. Barn Owl. Jen. Brit. Vert. An. 92.

Operculum margined with linear oblong perfect feathers; bill yellowish-white; claws blackish-grey; upper parts light reddish-yellow; variegated with minutely mottled ash-grey, and small black and white spots; facial disks and lower parts white; the latter with small dusky spots. Young similar to the adult, but with the upper parts darker.

MALE.—The Common Barn Owl of this country, to which I have given the name of European Screech-Owl, to distinguish it from an American species, which has usually been confounded with it, is one of the most beautiful birds of the family to which it belongs, and, were it not for the enormous size of its head, would not be deficient in elegance of form. The proportions of its parts being fully described in the generic character, it is unnecessary to repeat them here. There is a peculiarity in this species however which requires to be attended to: the operculum is fringed with delicate feathers having all their parts complete, whereas in the very closely allied American Screech-Owl, these feathers are destitute of the filaments and shaft, being reduced to the tube.

The tongue is three quarters of an inch in length, narrow,

and bifid. The œsophagus four inches and a half long, and of the nearly uniform width of nine twelfths; the stomach two inches in diameter, round; its muscular coat very thin; the pylorus extremely narrow; the intestine twenty-three inches long, from four and a half twelfths to a twelfth and a half in width; but enlarged beyond the cœca, which are two inches and a quarter in length, a twelfth and a half in width for one inch, then dilated into an oblong sac, of which the greatest width is three twelfths; the rectum two inches long, its cloacal dilatation globular, and one inch in width.

The plumage is extremely soft, the feathers generally oblong; the disks and ruff complete; the wings long, the first quill one twelfth of an inch shorter than the second, which exceeds the third by four-twelfths; the tail short, decurved, almost even at the end.

The bill is yellowish-white; the cere and inside of the mouth light flesh-colour; the iris black, the edges of the eyelids dark brown; the scales of the toes dusky, the claws dark purplish-grey. The facial disks are white, with a large brownish-yellow spot before the eye; the ruff-feathers reddish-yellow in their upper third, then yellowish white, and toward the bill tipped with brown. The general colour of the upper parts is light reddish yellow, variegated with ash-grey, each feather being toward its extremity of the latter colour, minutely undulated with darker grey, and having near its tip a small oblong space marked with two white and two dusky spots. The quills are of the general colour, minutely dotted with grey; the primaries with four or five indistinct dusky bars or spots on both webs, and having more than half the breadth of their inner webs white; the secondaries similarly marked, but with their tips and nearly the whole of their inner webs white. The tail has four bars, with a slight basal bar or spot, the lateral feathers yellowish-white with the bars smaller. All the under parts are pure white, each feather, excepting on the throat, with a small faint roundish dusky spot near the tip.

Length to end of tail 14 inches; extent of wings 35; wing from flexure 11¼; tail 5; bill along the ridge 1½, along the

edge of lower mandible $1\frac{1}{2}$; tarsus $2\frac{5}{12}$; hind toe $\frac{1}{2}$, its claw $\frac{8}{12}$; second toe $1\frac{1}{4}$, its claw $\frac{3\frac{1}{2}}{12}$; third toe $1\frac{4}{12}$, its claw $\frac{8}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{7}{12}$.

Female.—The female is considerably larger, but differs little in colour, the upper parts being merely somewhat darker. In a perfect specimen examined on the 3d October 1835, the diameter of the aperture of the eye was seven twelfths, that of the ear measured four and a half twelfths in one direction, and two and a half twelfths in the other; the operculum an inch and a twelfth in length, five and a half twelfths in height. The bill flesh-coloured, with a small portion of the tips yellowish-white; the cere and inside of the mouth flesh-coloured; the iris black; the edges of the eyelids and nictitant membrane blackish-brown; the tarsal scales purplish-brown, the scutella and claws dark purplish-grey; the soles dull greyish-yellow. The facial disks white, with a brownish-red patch anterior to the eye. The inner feathers of the ruff white, the rest buff, those of its lower third tipped with brownish-black. The upper parts are light reddish-yellow, variegated with ash-grey, which on the hind-neck and back is the prevailing tint, when the feathers are laid close, although it occupies only a small portion of the end of each, which is minutely mottled with greyish-white and dark greyish-brown, and has along the median line from two to five small spots of dark brown and white. The primary quills are mottled with grey at the end, the secondary more or less over the outer webs; there are five faint bars of brownish-grey in dots and undulations on the outer, and greyish-brown spots on the inner webs; all the quills pure white on three-fourths of the breadth of their inner webs. The tail is more distinctly marked with five dark-grey bands; the inner webs, excepting the two middle, and the outer webs of the two lateral, white. The sides and fore part of the neck of a most delicate pale buff; the rest of the lower parts, including the surface of the wings and tail, white; some of the feathers of the sides and a few of the lower wing-coverts have two small dark spots near the end.

Œsophagus four inches and a half long; stomach broadly

oval, two inches and three-eighths in length, one inch and three-eighths in breadth; the central tendons five-eighths by five-twelfths, and six-eighths by five-twelfths; pylorus very narrow, with a roundish knob projecting from its thickened margin; intestine nineteen feet long, in the duodenal part five-twelfths in width, at the smallest near the cœca two and a half twelfths; the cœca two inches and two-twelfths in length, for one inch of the uniform width of two-twelfths, then enlarged into an obovate sac, five-twelfths in its greatest width; the rectum two inches and a half long, with a large globular cloaca.

In another individual shot in April 1836, the tongue was nine-twelfths long, the œsophagus four inches and a half, ten twelfths in width; the stomach two inches in diameter; the intestine twenty-two inches long; the cœca two inches and a quarter, the rectum two inches.

Length to end of tail 15 inches; to end of wings $15\frac{1}{2}$; extent of wings 38; wing from flexure $11\frac{3}{4}$; tail 5; bill along the ridge $1\frac{1}{2}$; along the edge of lower mandible $1\frac{1}{2}$; width of mouth 1; tarsus $2\frac{4}{12}$; hind toe $\frac{7}{12}$, its claw $\frac{9}{12}$; second toe $1\frac{1}{4}$, its claw $\frac{1}{12}$; third toe $1\frac{4}{12}$, its claw $\frac{10}{12}$; fourth toe $\frac{9}{12}$, its claw $\frac{10}{12}$.

Variations.—In individuals apparently adult, some slight differences are observed in the colouring. The bill is ivory-white, or tinged with yellow, or flesh-colour; the facial disks rarely without a reddish patch, which however varies in size; the ruff sometimes entirely white, sometimes tipped with buff or yellowish-brown, its lower part often dark brown or dusky. The upper parts are more or less grey or yellow, and the lower sometimes pure white, sometimes tinged with yellow, but usually marked with small dusky spots.

Changes of Plumage.—Toward the period of moult, there is less grey on the upper parts, and the spots on the lower are fewer, the tips of the feathers having been partially abraded.

Habits.—If we give "a local habitation" to the White Owl,

let it be, not a barn, nor a cathedral, but this huge mouldering tower, once the seat of the powerful lords of Borthwick. To it I give the preference, because, as the minister of the parish remarks, "It is pleasing to recollect, that it has not been stained or rendered in any respect horrible to the imagination by the perpetration of any of those darker and more atrocious crimes which were so common in Scotland during the times of the Jameses, and which still seem to adhere in gloomy colours to the ruins that awaken our interest. But families," as the reverend man observes (gentleman, I say not, for no bishop of a christian church can be distinguished by any title that belongs merely to the world) "have their times of rise, of grandeur, and of ultimate decline. The immense possessions of this once powerful and respectable family have long fallen to other occupants, their race has become almost extinct, and the scene of their greatness and splendour is an uninhabited and fast crumbling ruin. It is solemn, amidst such thoughts, to stand, while the shadows of evening are falling on the surrounding glen, beside the ever-murmuring brook that hastens down the valley, and to permit the scene before us to make its natural impression on our minds. A few scattered lights are beaming from the humble windows of the lowly cottages that lie under the shadow of the ruin; the castle itself, in all its gloomy and solitary grandeur, still lifts its imposing mass into the dusky air; and over all are the enduring lights of heaven, which have witnessed, without change, so many revolutions among the dwellings of men, and which are destined, through the long coming years of the history of our race, to shine on so many myriads who have as yet no intimation of the wonders of that ever-varying scene into which they are eventually to be ushered. The present, the past, and the future, are thus brought, by the different features of the scene, at one moment before us; and each portion of the picture derives additional interest from the others with which it is associated. The effect of the whole is an impression that is at once solemn and imposing."

If the belief of ghosts had not long ago been extinct among the more enlightened at least, to which class I and my readers belong, I had taken that shriek for the cry of the beautiful, guilty,

If the belief of ghosts had not become extinct, that shriek might have sent a thrill through our flesh, and bristled our hair; b

~~and deservedly miserable queen Mary.~~ But it may not be: we are now reduced to the necessity of seeking for natural causes. Gliding downwards from one of the higher windows comes the bird of night. Meteor-like it sweeps away, flying at the height of a few feet from the ground; and in endeavouring to trace its course, we lose all that mysterious feeling which its scream excited. The poor bird in fact has nothing to do with the ghosts of grim and bloody barons, or gay ladies: it is a thing of mere bone, muscle, and feathers, intent on procuring a few heedless mice, to satisfy the cravings of its own appetite and that of its voracious young. ~~Yet, so frail, so sensitive, or so imaginative is humanity, that the harsh sound causes to thrill in the breast of him on whose ear it unexpectedly comes, a cord which emanates directly from the organs of wonder and fear, if such indeed there be, for man must ever be to man a great mystery.~~ The spectral bat now flutters on leathern wing, the beetle bounces away into the dim shade, silence and darkness envelope the earth, and if the lone wanderer be not a mere philosopher, some holy thought, some sadly pleasing emotion, some sense of the presence of God, must arise in his breast. But let us proceed more methodically.

The Barn Owl chooses for his place of repose some obscure nook in an old building, the steeple of a church, a tower, a dovecot, or a hollow tree. There he remains from sunrise to sunset, in a nearly erect posture, with retracted neck, and closed eyelids, dozing away the hours in which, from the structure of his eyes, he is unable to perceive his prey, and waiting for the return of twilight. If approached in this state, instead of flying off, he raises his feathers, hisses like an angry cat, clicks his bill, and thus threatens the intruder. Should he by any accident be driven abroad, he seems dazzled and bewildered. Incapable of distinctly perceiving the objects around him, he flits about with an unsteady flight, and is glad to betake himself to some dark retreat, where he may be sheltered from the light, as well as from his numerous enemies. The appearance of an Owl in open day is a phenomenon that excites the curiosity as well as hatred of many species of birds, even the smallest of which will gather around, chide, and ha-

rass him, while the larger will not hesitate to attack him with their bills and wings. The Blue Tit, being among the boldest of our little birds, takes a prominent part in these proceedings, and the Chaffinch, gentle as it is, distinguishes itself by its vociferous animosity. Sometimes this Owl reposes in the upper part of a tree in a dense wood, or even in a thicket ; and should it be discovered in the latter situation by any of these birds, their outcries presently bring a band of enemies around it. But although the Barn Owl is thus so imbecile by day as to suffer itself to be insulted with impunity by the pettiest aggressor, it assumes a very different character when darkness restores to it the faculty of clearly distinguishing objects.

By watching near its haunts, or taking his station in the neighbourhood of some farm-steading frequented by it, one may dimly see it advance with silent and gliding flight, skimming over the fields, shooting along the hedge-bank, deviating this way and that, and now perhaps sweeping over head, without causing the slightest sound by the flappings of its downy wings. On perceiving an object, it drops to the ground, secures its prey in a moment, and uttering a shrill cry, flies off with it in its claws. In a little time it returns, and thus continues prowling about the farm-yard for hours. The domestic mouse, Wood Mouse, Common Arvicola, Shrew, Lark, and young birds of different species, are the objects which I have found in its stomach. The mice are generally swallowed entire, often without their bones being broken, but the birds are torn to pieces. Young hares and rabbits, as well as lepidopterous and coleopterous insects are said by several persons to form part of its food. Mr Waterton, whose opportunities of observing its habits are unrivalled, he having in a manner domesticated this species, informs us that it carries off rats, and occasionally catches fish. " Some years ago," he says, " on a fine evening, in the month of July, long before it was dark, as I was standing on the middle of the bridge, and minuting the owl by my watch, as she brought mice into her nest, all on a sudden she dropt perpendicularly into the water. Thinking that she had fallen down in epilepsy, my first thoughts were to go and fetch the boat ; but before I had well got to the

end of the bridge, I saw the owl rise out of the water with a fish in her claws, and take it to the nest." It has been alleged that it does not prey on Shrews; but I have found four skulls of these animals, along with two of an Arvicola, in the stomach of one. The quantity which it swallows may seem surprising to a person who does not consider how many mice may be squeezed into a sac two inches in diameter. Remains of eight or ten animals may sometimes be found in its stomach, but in various degrees of decomposition, the greater part of some having passed into the intestine before the rest have been procured. The skulls and other bones, enveloped in the hair, are ejected in pellets, after the bird has retired to its resting-place. "When it has young," says Mr Waterton, "it will bring a mouse to its nest about every twelve or fifteen minutes. But in order to have a proper idea of the enormous quantity of mice which this bird destroys, we must examine the pellets which it ejects from its stomach in the place of its retreat. Every pellet contains from four to seven skeletons of mice. In sixteen months from the time that the apartment of the owl on the old gateway was cleaned out, there has been a deposit of above a bushel of pellets."

The shriek of the White Owl, occasionally heard at night, and usually in solitary places, which few persons enter without some feeling of awe, has given it a kind of mysterious character with the vulgar; and it must be confessed that, independently of any superstitious feeling, its cry coming unexpectedly on the ear, in a church-yard, or among the crumbling ruins of some monastery or castle, is little calculated to inspire pleasant ideas. In like manner, the long loud wailing cry of the Great Northern Diver, heard from the dark bosom of the ocean, by a person wandering at night on the lonely shores of the Hebrides, infallibly strikes him with no inconsiderable degree of awe. The White Owl has no other cry, if we except the hissing noise which it makes. The snoring sound heard from its nest, Mr Waterton informs us is the cry of the young for food.

The nest, which is placed in the usual retreat of the bird, is composed of twigs and straws loosely arranged. The eggs,

from two to five in number, an inch and a half in length, an inch and a quarter in breadth, and thus of a broadly elliptical form, are pure white and smooth. The young are at first covered with white down. It appears that several broods are produced annually, for young birds have been found in the nest from April to December. Mr Blyth, in the Field Naturalists' Magazine, Vol. I, p. 187, states that a nest of the Barn Owl was found in the neighbourhood of Tooting, containing "two eggs, and when these were hatched two more were laid, which latter were probably hatched by the warmth of the young birds; a third laying took place after the latter were hatched, and the nest at last contained six young Owls of three different ages, which were all reared."

The Barn Owl is more extensively distributed, and more numerous, in Britain than any other species. Few ruined buildings of large size are destitute of a pair; but it is very seldom met with in the wilder and bleaker districts, or in the northern isles. Its favourite haunts are in the cultivated and sheltered parts of the country, where meadows and corn-fields foster the animals on which it habitually preys. In most parts of England it is not very uncommon, and the same may be said of the southern and middle divisions of Scotland. There can be no doubt that, whatever little depredations it may occasionally make upon the gamekeeper's charge, it ought to be protected as a benefactor to the farmer. This will especially appear from the following account of it given by my friend Mr Hepburn.

"The Barn Owl is by no means a very common bird in our part of East Lothian. Shortly before sunset it leaves its retreat, skims along the hedge-rows, hunts over the meadows and corn-fields like a spaniel, and drops suddenly on its quarry. You see him approach the homestead, on noiseless wing threading the labyrinth of stacks. He now enters the outhouses or the barn, and speedily reappears, with a mouse in his claws. Perching on the top of a stack he devours his prey, preens his feathers, and shrieks. Should plenty of food occur, he will remain all night, and visit the place very frequently. It is at this time, especially if the weather be fine, that mice

betake themselves to the outside of the stacks, where all night long they sport amongst the extremities of the sheaves, and doubtless drink the crystal dew-drops in their season. From his watch-tower the owl swoops down amongst them, or nimbly seizes them as he glides between the stacks. A sorry adept indeed he must be if he does not often secure one in each foot at a time. Five or six years ago, in the month of June, July, and August, I have often, with the assistance of a terrier, killed from a hundred and twenty to a hundred and fifty mice in one stack, containing the produce of about two acres and a half. In the very centre of the stack, about three feet from the ground, where the heads of the first six or eight sheaves meet, I have frequently seen about a peck of grain separated from the ears, and so broken by their gnawing as to resemble very coarse meal. Nor must we forget the owl's services in the meadow and corn-field. With such facts before his eyes, where is the man who has the least interest in the cultivation of the soil, that will not protect this beautiful and highly useful bird? I have endeavoured to put it on a good footing with game-keepers, but apparently with no better success than in the case of the poor Kestrel. Although Mr Jenyns, in his valuable Manual of British Vertebrate Animals, says that the Barn Owl rejects the Shrew, I found in the stomach of one which I procured on the 30th November 1839, an entire individual of the Sorex araneus, of which the bones only were broken."

The above account, I believe, contains as much of the history of this bird as is well known; but I cannot conclude without referring the reader to a very pleasing paper on its habits, in Mr Waterton's Essays on Natural History, in which its hooting, said to have been heard by a naturalist, is put much on the same footing as the double-doored nest of the Long-tailed Mufflin.

Young.—When fledged, the young have the bill and inside of the mouth pale flesh-coloured, the iris black, the scutella and claws pale purplish-brown. By this time the thin edge of the middle claw, which was at first entire, is partially serrated, hav-

ing several parallel transverse slits toward the end. The facial disks are dull white, with an orange-brown spot before the eyes; the ruff white, with the tips of the lower feathers reddish. The upper parts are pale reddish-yellow, mottled with grey and brown, as in the adult; the quills and tail of a lighter tint, tinged with grey, and thinly mottled; the tail with faint indications of bars.

Progress toward Maturity.—The young differing so little from the adult birds, the changes that take place in the colour of the plumage are very slight.

Remarks.—Several species not hitherto well described, being very intimately allied to the present, have usually been confounded with it, so that its distribution has been considered as extending over most parts of Europe, the whole of Africa, a portion of Asia, New Holland, and both divisions of America. The "Barn Owl" of the United States however is a distinct species, characterized, among other peculiarities, by its operculum, of which the feathers in all the individuals examined by me are as it were reduced to the tubes, the shafts being wanting. That species also is confined to the warmer regions, whereas ours extends far north; and its eggs are of a very elongated form, compared with those of ours. M. Temminck alleges that "l'espèce est absolument la même dans toute l'Amerique Septentrionale;" and again, "les individus de l'Amerique Septentrionale diffèrent seulement par quelques légères teintes plus sombres." Should the gentleman ever see this book, I hope he will look to the ear, and reflect that the males of the American birds are much larger than even the females of ours, the colour of the claws different, the lower parts always reddish. These absolute assertions are hurtful to the credit of ornithologists, and impose upon students, especially those who have the organ of credulity largely developed, or very active, or not counteracted by others.

In p. 551.

Order II. Volitatoriæ.

DE ULULIS.

Gentle Reader!—A lesson in Practical Ornithology ought to come here; but as the Owls have occupied so much space that only a single page is left for it, I hope you will excuse me if I substitute the relation of an occurrence which has afforded me some amusement.

Having one night in April laboured very assiduously in correcting these sheets, I became somewhat imaginative about three in the morning, and leaning back in my chair, beheld four Hooting-Owls, which, having entered by the chimney, alighted on the table in the midst of my books and papers. They had probably been attracted by the odour emanating from a Buzzard's skull, which I had recently dissected; for they presently rummaged about in search of something to pick at. Nothing here but dry sapless stuff, "Macgillivray's Raptores, &c." observed one of the owls; "Guts and gizzards," quoth another, "fit only for Turkey-vultures." "Tedious technicalities and objectless digressions," shrieked the third. "Besides," said the fourth, who had a dung-beetle in his bill, which he crushed and swallowed, "the fellow ought to imitate us, he has no respect to the majesty of nature, but when he sees a wren hopping in a whin-bush, he runs after it, and chirps to it." The owls now scattered my proof-sheets about, then marshalling in order, stared upon me with their "moony eyes," and swelling their throats with solemn gravity, emitted such a volley of discordant sounds, that, hardly knowing whether to laugh or to cry, I awoke. The light of morning gleamed through the shutters, and a Blackbird and Mavis sung their melodious matins in the garden of Heriot's Hospital opposite. Sweet birds, said I, it is not the first time I have been cheered by you. Willingly do I respond to your "harmonious call." The birds of night having received due attention, I now proceed to give the history of a more lively race.

X. EXCURSORES. SNATCHERS.

The fifteen British land birds which remain to be described, belong to nine genera, each of which is with us the representative of a family. These genera are Lanius, Coracias, Muscicapa, Bombycilla, Merops, Alcedo, Caprimulgus, Cypselus, and Hirundo. A detailed account of the structure and affinities of the families to which they may be referred would occupy more space than it might be expedient to devote to them in a work like this; and of two of them, Coracias and Merops, I have not had opportunities of examining the internal organs. I shall, however, in conformity with the plan adopted, present some remarks on these families, which in many essential respects differ so much from each other, that I am convinced they cannot with propriety be referred to less than three groups or orders, of the same value as those hitherto employed. At the same time it appears to me that in their general organization, Lanius, Coracias, Muscicapa, and Bombycilla, approach so nearly to the Thrushes, Warblers, and Tits, that they might perhaps be included in the same group. Merops and Alcedo, which appear to be nearly allied, are distinct from those just mentioned, and with other genera might form an order. Hirundo appears to be closely allied to Muscicapa and other genera of the same family, as well as to some of the Cantatores; while Cypselus and Caprimulgus seem to belong to a separate group, the former being analogous to the diurnal, the latter to the nocturnal Raptores. Although I thus do not profess to place these nine

genera or families in their natural position, I think they may be arranged into three groups or orders: the first, that of the Excursores, containing the Shrikes, Rollers, Flycatchers, and Chatterers; the second, or that of the Volitatores, being composed of the Swallows, Swifts, and Goatsuckers; and the third, or that of the Immersores, including the Bee-eaters as well as the Kingsfishers.

The birds of which the family of Excursores is composed, namely the Shrikes, Flycatchers, and Chatterers, of which the older systematic writers formed only three genera, but which latterly, on account of their vast number, and the diversity of form exhibited by them, have been divided into numerous groups, have for the most part a peculiar habit of assuming a station on a twig or other eminence, and of sallying forth from it to seize upon insects that may happen to approach, after which they return to their perch, or assume another station. These excursions of theirs, and the dexterous manner in which they snatch their insect prey, have induced me to name them as above.

They are generally of small size, averaging perhaps that of a Song Thrush, sometimes very diminutive, and seldom exceeding a Jay or a Jackdaw. Their bill is short or of moderate length, broad at the base, compressed at the end, the upper mandible having a small decurved tip, behind which, on either side are a sinus or notch, and a toothlike process, which is frequently very prominent. The palate is flat; both mandibles concave toward the end, with a prominent median line; the tongue narrow, flat, emarginate and papillate at the base, thin-edged, with the point slit or lacerated. The œsophagus is wide, destitute of crop; the stomach is elliptical, moderately muscular, having two distinct lateral muscles, its epithelium dense and rugous; the intestine short, and wide; the cœca very small. The trachea is cylindrical or somewhat tapering; the inferior larynx with four pairs of muscles, sometimes blended into two pad-like masses. Plate XXII, Figs. 1, 2, 3.

The body is ovate; the neck short; the legs very short and small, or of moderate size; the tarsus much compressed, covered anteriorly with about seven scutella, of which the upper are

often blended; the toes four, compressed; the hind toe stouter and with its claw nearly as long as the third toe, which is united to the second at the base, the lateral toes nearly equal. The claws are rather long, curved or arched, much compressed, laterally grooved, and very acute. The wings, Fig. 250, vary in length, but are generally rather long, more or less rounded, of eighteen quills, the first very small, the third and fourth longest. The tail is composed of twelve feathers, but varies in size and form.

The skeleton does not differ materially from that of the Cantatores, Vagatores, and Deglubitores. The same may be said of the arrangement of the plumage, the principal difference existing in their having the base of the upper mandible furnished with strong bristles directed obliquely forwards, Figs. 250, 254, the object of which seems to be to enable them with more certainty to seize their insect prey. Their feet, Figs. 254, 257, are generally smaller, especially the toes, and they are little addicted to walking or leaping on the ground, many of them being by the feebleness of their posterior extremities incapacitated for performing these actions effectually.

Species of this order occur in all parts of the globe; but their number increases with the increase of temperature, and those which reside in the colder regions migrate southward as winter approaches. These circumstances are evidently in connexion with the supply of insect food, besides which, however, they eat worms, mollusca, and sometimes fruits. The larger species are addicted to the pursuit of mice, small birds, frogs, lizards, and other reptiles, which, as well as large insects, they generally spit on thorns. They are shy, ferocious, tyrannical, and unsocial birds; frequent woods, thickets, hedges, and gardens; and have a rapid, buoyant, undulating flight. Their voice is generally harsh, but many of them imitate the cries of other birds, and some have a modulated and pleasant song. They nestle in trees and bushes, sometimes in holes in walls, and construct an elaborate nest, lining it with soft materials. Their eggs are generally about five. The young are born blind and bare, and are assiduously tended, and courageously protected by their parents. These birds are in fact remarkable for their au-

dacity, for they will not hesitate to attack a hawk or other bird greatly superior to them in strength, and usually succeed in driving it off.

In Europe there are proportionally few of these birds; and in Britain, not more than five species have been found, of which only one is common. If we confine ourselves to the consideration of the characters and affinities of our indigenous birds therefore, we can form no correct idea of the connexions of the order, or of the groups into which it may be divided. Of these groups it is unnecessary here to indicate more than the names and principal characters, with some of the genera of which they are composed.

The *Laniinæ*, Shrikes or Butcher Birds, of which may be mentioned the genera Lanius, Falcunculus, Malaconotus, and Thamnophilus, have the bill of moderate length or short, broad at the base only, compressed in the rest of its extent, with a decurved tip, and a prominent toothlike process; the wings of moderate length, and concave; the feet of ordinary length, rather stout, the claws large and curved. Three species are found in Britain, but none are resident.

The *Myiotherinæ*, or Flychasers, exemplified by the genera Myiothera (Tyrannus, Vieill.), Dicrurus, Muscicapa, Muscipeta, and Todus, have the bill of moderate length, or rather long, broad, depressed, with a suddenly compressed, very small, deflected tip, and a distinct notch; the mouth wide; the tarsus very short, with very large scutella, the toes very small, and the wings rather long and straight. They are the typical birds of this order, or those which present its characters in the greatest perfection. Two species occur in Britain, both summer birds.

The *Ampelinæ*, or Chatterers, including the genera Ampelis, Casmarhynchus, Rupicola, Calyptomina, Procnias, Bombycilla, Pipra, Pardalotus, Vireo, and some others, have the bill generally short, broad at the base, compressed at the tip, which is small and deflected, with a distinct notch, the mouth wide (but rarely if ever opening beyond the eyes, as has been erroneously stated), the feet very small, and the wings generally long. They are in some respects allied to the Hirundinæ or Swallows, as well as to the Myiotherinæ. Only a single

species occurs in Britain, and that merely as an irregular visitant.

The *Psarinæ*, including the genera Psaris, Eurystomus, Coracias, Irena, and several others, have the bill generally large, with its sides convex, its height and breadth nearly equal at the base, the tip of the upper mandible very small and deflected, with a sinus on each side, but seldom with a tooth-like process; the tip of the lower mandible narrow and obliquely truncate; the nostrils large; the tarsi very short, with very large scutella, the toes rather large, the claws moderate and well curved; the wings large and broad. Only one species, Coracias garrula, occurs in Britain.

These latter birds have been placed by some in connexion with the Crows, and by others with the Kingsfishers and Bee-eaters; but I think their general structure, their very short broadly scutellate tarsi, broad wings, and more or less bulging bill, of which the tip is always deflected, indicate that their position is near the Shrikes and Flycatchers.

After Bombycilla garrula. p. 536.

Family IV. LANIINÆ. Laniine.

SHRIKES AND ALLIED SPECIES.

Muscicapinæ

The Shrikes and allied genera differ from the ~~Myiotherinæ~~ chiefly in the form of the bill and feet, the former being stronger, less expanded at the base, and more compressed towards the end, with a stronger dentiform process, the latter much stouter and more elongated.

The bill is rather short, or of moderate length, strong, as high as broad at the base, compressed; the upper mandible with the dorsal outline straight or convex, the ridge more or less rounded, the sides convex, the edges sharp, the notch and dentiform process well marked, the tip slender, declinate or abruptly decurved, and acute; the lower mandible with the angle rather short and broad, the dorsal outline convex and ascending, the back broad at the base, the sides convex, the edges more or less inclinate, the tip small, ascending, with a sinus behind. Fig. 251.

The nostrils are rather small, roundish or elliptical, in the fore part of the rather large nasal membrane, which is covered with bristly feathers at the base. The eyes are of moderate size. The aperture of the ear roundish and large.

The general form is compact, moderately full; the body ovate; the neck rather short; the head large, broadly ovate or roundish, and flattened above. The feet are short, but of moderate strength; the tarsus short, but longer than the hind toe and claw, its anterior scutella generally blended above; the toes moderate, compressed; the hind toe much stouter, the outer toe united at the base with the third; the claws rather large, much arched, compressed, laterally grooved, and very acute.

The plumage is soft and blended; the feathers ovate and

rounded. About five large stiff bristles at the base of the upper mandible on each side; smaller bristles on the nasal membrane. Wings, Fig. 150, of moderate length, broad, semi-ovate, often concave, rounded, with nineteen quills; the first not generally half the length of the second, sometimes wanting; the third, fourth, and fifth longest. Tail of twelve straight feathers of moderate breadth, varying in length and form, generally a little emarginate and rounded.

The Laniinæ, composed of the genera Lanius, Falcunculus, Telephonus, Malaconotus, Thamnophilus, Vanga, Barita, and others, are in a manner intermediate between the ~~Myiotherinæ~~ Muscicapinæ, Turdinæ, Corvinæ, and Falconinæ, of which they combine the characters and habits. With the ~~Myiotherinæ~~ Muscicapinæ they agree to a certain extent in the form of their bill and feet, and in their being addicted to the pursuit of insects; but they differ in having the bill stronger, although more compressed, and the feet better adapted for walking and perching securely. In the latter circumstance, in the form of the wings and tail, and in some degree in that of the bill, they are allied to the Turdinæ, which they also partly resemble in habits, being to a great extent plurivorous. The affinity of many of them to the Hawks is very striking, especially in the form of the bill, which is strong and more or less hooked, as are their claws. Accordingly, not content with insects, worms, mollusca, and fruits, many of them attack live birds and quadrupeds. So great in fact is their resemblance to the Falconinæ in these respects that they have frequently been placed by systematists in the same order. They are truly rapacious birds, and certainly a Shrike is as nearly allied to a Falcon as many Vultures are. Nor would it at all, in my opinion, be less in accordance with the affinities of these groups were the analogical systematists to consider them as the insessorial section of the Raptores, rather than as the raptorial section of the Insessores. I therefore humbly suggest to Mr Swainson the propriety of removing the Dididæ out of the Raptorial circle, as nature has fairly expunged them from her album, and putting in their place the Laniidæ. The Falconidæ and Strigidæ might form a single group. The Vulturidæ may remain. And thus the Raptores will be composed

of three orders, not circularly disposed however, which birds can never with truth be, as they have affinities not in two, but in twenty directions. With this ternary commencement it will by no means be difficult to find other ternary groups to agree analogically, so that a beautiful system of nine orders will arise, each order divided into three sub-orders, the latter into as many nations, tribes, families, genera, and species. Such an arrangement would be much more symmetrical than one of fives, and could be easily elaborated without the necessity of risking so temerariously the respectability of the scheme by alleging that a bird like Gypogeranus is a rasorial eagle, or Rhynchæa a rasorial snipe.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. LANIUS. SHRIKE.

Bill short or of moderate length, stout, broad at the base, compressed toward the end; upper mandible with a large tooth-like process on each side, and a narrow decurved tip; head large, roundish; legs of moderate length; tarsus rather short, compressed, with seven anterior scutella; hind toe rather stout, lateral toes nearly equal; claws arched, compressed, acute; plumage blended; bristles stiff; wings of ordinary length, with the first quill very short, the fourth longest; tail long, graduated or rounded.

1. *Lanius Excubitor.* ~~*Great*~~ *Cinereous Shrike.* Ash-grey above, white beneath; quills black, with their bases white.

~~2.~~ *Lanius rufus. Woodchat Shrike.* Upper parts variegated with black, white, and red; lower white. Female with the colours duller, the breast with transverse brownish lines.

~~3.~~ *Lanius Collurio. Red-backed Shrike.* Back and wing-coverts brownish-red, upper parts of head, hind-neck, and rump ash-grey; breast and sides rose-coloured. Female with the colours duller, the lower parts greyish-white undulated with dusky.

* Genus II. Ennecetonus. Wood-Shrike.

Linn.

Genus I. LANIUS. SHRIKE.

Bill rather short, strong, pentagonal at the base, higher than broad, much compressed toward the end: upper mandible with its dorsal outline convex, the ridge rather narrow, the sides sloping at the base, nearly erect toward the end, the nasal sinus moderately large and anteriorly rounded, the edges slightly overlapping, the notch distinct, with a marked projection behind it, the tip considerably decurved, compressed, slender, and acute; lower mandible with the angle short and rounded, the dorsal outline ascending and convex, the sides convex, the edges direct, the tip slender, curved a little upwards, and acute; the gape-line somewhat arched.

The mouth rather wide; the upper mandible internally concave, with a strong prominent median line; the lower more deeply concave, with a similar line; the palate soft, flat, with two longitudinal ridges. The posterior aperture of the nares oblongo-linear, edged with small papillæ. Tongue sagittate at the base, tapering, concave above, its edges thin, the tip slit and lacerated. The œsophagus of moderate width, without crop or dilatation; the proventriculus oblong, with short cylindrical glandules. The stomach elliptical, moderately muscular, its tendons round; the inner coat thin and rugous. The intestine short, its duodenal portion wider; the cœca very small and cylindrical; the rectum very short, with an oblong dilatation. Plate XXII, Fig. 1.

Nostrils rather small, roundish, in the fore part of the nasal membrane, which is covered with bristly feathers directed forwards. Eyes of moderate size; eyelids feathered on the edges only. External aperture of the ear roundish and rather large.

The general form is compact; the neck short; the head ovate, large, and flattened above. The legs are rather short, and of moderate strength; the tarsus rather slender, com-

pressed, with seven anterior scutella, sharp behind, the long lateral plates with several transverse divisions ; the toes rather small, much compressed, the outer and middle toe united as far as the second joint ; the first much stouter and comparatively long ; the two lateral nearly equal, the middle much longer ; the claws rather long, arched, much compressed, laterally grooved, rather slender, and extremely acute.

Plumage soft and blended ; the feathers ovate and rounded. A row of stiffish bristles along the base of the upper mandible. Wings of moderate length, broad, semiovate, rather rounded ; quills nineteen ; primaries ten, tapering to a rounded point ; secondaries broader and more rounded. Tail long, straight, of moderate breadth, rounded, of twelve rather narrow rounded feathers.

The Shrikes are remarkable for the direct affinity which they exhibit to the Falconine birds, in the structure of their bill, and in their rapacious habits, most of the larger species killing small birds, mice, and other animals. In their general form, their plumage, and the structure of their feet, however, they resemble the Turdinæ and Sylviinæ, to which they are further allied in their mode of flight, in the structure of their digestive organs, and consequently in feeding chiefly on insects and soft fruits. Referring to British birds, we should find our Shrikes more nearly allied to the Missel Thrush and Fieldfare than to any other species ; and should scarcely suspect them of having any affinity to the Flycatchers, with which, however, the genus is connected by the intervention of several genera of exotic birds, such as Edolius, Graucalus, and Tyrannula. Their habit of perching on a twig or other elevated spot, whence they sally forth in pursuit of insects, and the comparative shortness of their toes, are also indicative of this affinity.

They are generally unsocial birds, whose sympathies do not extend beyond the circle of their own family, tyrannical, and consequently disliked by their neighbours of the insectivorous tribes, many of which exhibit as much alarm at their presence as they would on approaching a hawk. But their boldness is not directed solely toward the weaker birds, for they exhibit great courage in defending themselves and their nests from

more powerful enemies. Their voice is generally harsh and screamy; they fly in an undulating manner, and seldom alight on the ground, where their motions are constrained. Species of this genus occur in the warm and temperate parts of the old continent, and in North America. In the colder regions they are generally migratory, as their food consists chiefly of insects, which they frequently seize on wing while passing near their selected station on a twig. The larger insects they usually impale on a thorn, or fix in the fork of a branch, in order to tear them asunder conveniently, as they do not generally, like the hawks, stand on their prey while feeding. In their nidification they resemble the Thrushes, and other birds of the Turdinæ, Sylviinæ, and Sturninæ, forming an elaborate hemispherical nest, in which are deposited from four to eight spotted eggs. The young are born blind and naked, and are fed with insects and worms, sometimes also with the flesh of small quadrupeds and birds.

Three species are found in Britain: the ~~Great~~ Cinereous, Shrike, the ~~Woodchat~~, and the Red-backed Shrikes.
Black-backed Wood-



Fig. 250.

1. LANIUS EXCUBITOR. THE ~~GREAT~~ CINEREOUS SHRIKE.

GREY SHRIKE. BUTCHER BIRD. MOUNTAIN MAGPIE.



FIG. 251.

Lanius Excubitor. Linn. Syst. Nat. I. 135.
Lanius Excubitor. Lath. Ind. Orn. I. 67.
Cinereous Shrike. Mont. Orn. Dict.
Pie-grièche grise. Lanius Excubitor. Temm. Man. d'Orn. I. 142.
Great Cinereous Shrike. Lanius Excubitor. Selb. Illustr. I. 148.
Lanius Excubitor. Cinereous Shrike. Jen. Brit. Vert. An. 95.

Male with the upper parts light ash-grey, the lower white; on the side of the head from the nasal membrane to behind the ear, a broad black band, margined above with white; quills brownish-black, their bases white, forming two patches of that colour when the wing is closed; terminal portion of outer scapulars, and tips of all the quills excepting the outer five, white; tail black, the feathers white at both extremities, the latter colour enlarging towards the sides, so that the lateral feather is entirely white, excepting part of the shaft. Female similar, but with the foreneck and breast marked with semicircular grey lines.

Male.—The Great Cinereous Shrike, although not gaudily coloured, is one of the most beautiful of its genus. It is about the size of the Fieldfare or Blackbird, and is of a rather robust form, having the body moderately full, the neck short, the head very large, ovate, and rather flattened above. The bill is rather short, very stout, high, compressed towards the end, the upper outline convex, towards the end decurved, the notch large, the dentiform process prominent, the tip acute and compressed; the lower mandible nearly straight, its dorsal outline convex and ascending, its tip ascending, small, with a sinus in the margins. The roof of the mouth is nearly flat, with two longitudinal papillate ridges, and an anterior median ridge; the posterior aperture of the nares oblong, with an anterior slit. The tongue, Plate XXII, Fig. 1, *a*, slender, seven-twelfths long, sagittate and papillate at the base, concave above, horny toward the end, with the margins lacerated, and the tip slit. The œsophagus, *b c d*, is two inches nine and a half twelfths long, from four and a half twelfths to three-twelfths in width; the proventriculus, *c d*, five-twelfths in breadth, its oblong glandules forming a belt four-twelfths in breadth. The stomach, *d e f*, is a gizzard of considerable power, broadly elliptical, an inch long when distended; its muscular coat rather thin, on the right side thicker; the epithelium dense, thin, longitudinally rugous, and dull yellowish-red. The intestine, *f g h l*, is eleven and a half inches long, from three-twelfths to a twelfth and a half in width; the cœca, *j*, two-twelfths long, and about half a twelfth in width; the rectum one inch long, enlarged into an oblong cloaca, *k l*. The right lobe of the liver is much larger than the left. The heart is very large, being eight and a half twelfths long, or equal to one-third of the whole length of the cavity of the thorax and abdomen. The trachea, *m n*, which is two inches long, and two-twelfths in breadth at the upper part, has sixty rings, of which the last two are dimidiate; the bronchial half-rings, *o*, fifteen. The muscles are precisely as in the Thrushes, there being four distinct pairs on the inferior larynx. The nostrils basal, rather small, roundish, or broadly elliptical, concealed by the feathers; the eyes rather large, their aperture measuring nearly three-twelfths of an inch in length; that of the ears also large, its diameter

being four-twelfths. The feet are moderately stout; the tarsus of ordinary length, rather slender, compressed, with seven broad anterior scutella, its lateral plates meeting at an acute angle behind, the outer divided into seven pieces; the hind toe strong, with eight scutella, the anterior toes rather small, the outer a little shorter than the inner, which has eight, the middle twelve, and the outer ten scutella. The claws are rather long, arched, much compressed, laterally convex, and very acute.

The plumage is very soft and blended; the feathers ovate, with their filaments loose toward the margins. There are six strong bristles at the base of the upper mandible on each side, and the feathers covering the nasal membrane are bristly and directed forwards. The wings, Fig. 250, are of moderate length, and very broad; the third quill longest, the fourth almost as long, or equal when the wing is closed, the first nearly half the length of the third, and an inch and four-twelfths shorter than the second, which is seven-twelfths of an inch shorter than the third, and intermediate in length between the sixth and seventh. There are nineteen quills, of which the primaries are narrowly, the secondaries broadly rounded, with a minute tip. The tail is long, straight, graduated, the lateral feathers an inch and two-twelfths shorter than those next the middle, the latter being one-twelfth of an inch shorter than those on each side.

The upper mandible is brownish-black, with a little pale yellowish-grey on the margins at the base; the lower mandible of the latter colour, with the tip brownish-black. The iris dark brown. The feet brownish-black. The upper parts are light ash-grey, the rump paler. A narrow band of white margins the forehead, and extends over the eyes; and beneath it a broad band of black commences narrow on the middle of the forehead, covers the loral space, extends over and beneath the eye, and expands on the ear-coverts, beyond which it terminates. The terminal half of the outer scapulars is white. The wing-coverts, alula, and quills are brownish-black, the primaries toward the end externally greyish-brown. The edge of the wing, a patch formed by the base of the primaries and secondaries, and the tips of all the quills white, excepting those of the outer three, the secondaries being more largely tipped.

The tail is black, all the feathers tipped with white, that colour enlarging gradually outwards, so that the lateral feather is entirely white, excepting part of the shaft, and the next, or second from the side, has only a central streak of black; the bases of all the feathers are also white in the same proportion, although the band thus formed on them is narrow, and concealed by the coverts. The lower parts are white, but there are generally faint indications of transverse grey lines on the neck and breast; the lower wing-coverts also are white, but the primary coverts are more or less tinged with grey. The lower surface of the quills is white at the base, and grey towards the end; that of the tail is brownish-black and greyish-white, these colours being as abruptly defined as on the upper surface.

Length to end of tail 10½ inches; extent of wings 14¾; bill along the ridge $\frac{9}{12}$, along the edge of lower mandible $1\frac{1}{12}$; wing from flexure $4\frac{8}{12}$; tail 5¼; tarsus $1\frac{1}{12}$; first toe $\frac{5}{12}$, its claw $\frac{4\frac{3}{4}}{12}$; second toe $\frac{4\frac{3}{4}}{12}$, its claw $\frac{4}{12}$; third toe $\frac{7\frac{1}{2}}{12}$, its claw $\frac{4\frac{1}{2}}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{3\frac{3}{4}}{12}$.

The above description is taken from a recently killed adult male, presented to me by Mr Hepburn.

Female.—The Female is similar to the male, but with the following differences. The head and hind-neck are of a darker grey, or slightly tinged with brown; the band on the side of the head is blackish-brown; the black of the wings is more browned; and the lower parts are marked with faint transverse semicircular grey or brownish-grey lines, of which there are two on each feather of the fore-neck, breast, and sides.

Length to end of tail 10 inches; extent of wings 14; wing from flexure $4\frac{8}{12}$; tail 5.

Variations.—In adult birds some differences may be observed in the tints and markings. Thus, the white band over the eyes is sometimes faint, or not apparent, or very distinct; the lower parts may be pure white, or more or less undulated with grey lines; the relative length of the third, fourth, and fifth quills may vary, the fourth being sometimes longest; and the

bill may be nearly all black, and the feet more or less tinged with brown. Aldrovandus, Jonstone, and Brisson, mention a variety or individual all white, excepting the bill and claws which were black, and the feet which were yellowish.

Habits.—The Cinereous Shrike or Butcher Bird, although only an occasional or accidental visitant, and that chiefly in autumn and winter, has been met with in so many districts in England, that it is unnecessary to specify localities. In the south of Scotland also it has to my knowledge been shot in the counties of Peebles, Lanark, Mid-Lothian, and East-Lothian. In Edinburgh there are at present four Scottish specimens, one in the Museum of the University, another in Mr Stevenson's collection, a third in that of Mr Thomas Henderson, and a fourth in my own. In a list of the birds of Morayshire sent to me by Mr Barclay and the Rev. Mr Gordon, it is stated that "a specimen of Lanius Excubitor was killed by Mr Chas. W. Barclay at Calcots, near Elgin, in December 1836, and is now in the Elgin Museum. It is the only one known to have been killed in the district." In the Statistical Reports it is also repeatedly noticed. Thus, it is said to have occurred at Mountboy Wood, in the parish of Craig in Forfarshire; in Kirriemuir in the same county; in Galashiels, in Selkirkshire, &c.; but these reports are not always worthy of credit, as will appear to any ornithologist who examines them, from the curious mistakes often made by their authors. On the whole, however, it may be said that this bird, although rarely met with in Scotland, is not so extremely uncommon as to render an extended search for it in books at all commendable. I have not however met with it alive, and therefore must present a second-hand account of its habits.

I have seen about a dozen specimens obtained in various parts of Aberdeenshire from Braemar to Aberdeen and Peterhead

This species preys upon insects of various kinds, frogs, lizards, small birds and quadrupeds, which, after killing them by repeated blows of its bill, generally inflicted upon the head, it affixes to a thorn, or jams into the fork of a branch, that it may be enabled to tear them up into small morsels. Sometimes however it stands upon its prey, like a hawk, keeping it down with its feet while it breaks it up, and not bestowing

much care on clearing it of the hair or feathers, which, with the undigested parts of insects, it afterwards ejects in pellets. What remains after it is satisfied it hangs up; and this habit, together with its slaughtering propensity, has obtained for it the not inappropriate names of Butcher Bird, Lanius, and Thorn-kretzer, which are generically applied to the Shrikes, most of which are similar in this respect. Selecting a station on a twig or decayed branch, it sallies forth in pursuit of insects which happen to pass near, and it is probably from its remaining so perched for a long time that it has obtained the name of Excubitor, or the Sentinel; although another mode of accounting for this appellation has reference to its being employed on the continent in trapping hawks, when, being fastened to the ground, it apprises the falconer, by its loud screams, of the approach of a bird. Its flight is undulated, or performed in a waving line, and when searching for prey it occasionally hovers in the manner of a hawk. Although it is generally represented as carrying its prey in its bill, it appears that sometimes it employs its feet for that purpose. Mr Thomas Fenton, preserver of animals in Edinburgh, informs me that eight years ago, being out with a young man, Francis Dick, about half a mile to the north of Dundee, he was surprised to see a Grey Butcher-Bird fly out of a hedge with a bird dangling in its talons. His companion shot at but missed it, on which it flew to some distance, and alighted in a field, when they succeeded in shooting it. Its ordinary notes resemble the syllables *wee*, *wee*, pronounced loudly and sharply, and in anger it screams like a hawk; but it emits various sounds, and is said by several authors to imitate the notes and cries of many of the smaller birds, some conjecturing it to do so for the purpose of attracting them. On the continent it places its nest, which is very large, in the fork of a branch at a considerable height from the ground, forming it of moss and stems of dry grass, and lining it with wool and hair. The eggs are from five to eight, greyish-white, marked toward the larger end with spots of reddish-brown and greyish-purple; their length an inch and two-twelfths, and their greatest diameter ten-twelfths. They defend their nest against crows and hawks with admirable

courage and skill, so as to put to flight birds possessed of ten times their strength; and their affection for their young corresponds with the ardour of their temper, as appears to be generally the case in animals. After the young come abroad, they remain with their parents until the commencement of the pairing season.

Although individuals have been found with us at all times of the year, it has not been observed to breed in this country. It is not uncommon however in France, where it remains all the year, keeping in summer and autumn generally in the woods, but approaching inhabited places in winter, and thus appearing to be more common at that season. It is found as far south as Spain and Italy, and extends northward to Sweden, Russia, Norway, and Lapland, leaving these countries however at the approach of winter.

In England, its migrations are very irregular. Messrs Sheppard and Whitear have, in the Linnæan Transactions, Vol. XV, the following remarks on this subject:—"It has been killed in Suffolk in the months of January, April, May, and September. And on the 9th of July 1816, we saw a female Cinereous Shrike at Baytham in that county, which made a noise like that of a pair of shears clipping a fence. We are informed by the Rev. George Reading Leather, that this bird has been frequently seen in the Hyde near Bury (a large wood on the estate of Sir Thomas Gage), and that he has received a specimen shot there. In the autumn of 1819, four of these birds were sent to Mr Hunt, which had been killed in Norfolk. Early in December 1819, a Cinereous Shrike frequented a thick thorn hedge, near Mr Hoy's house in Higham, but was so shy that it could not be approached within gunshot. On examining the hedge Mr Hoy found three frogs, and as many mice, spitted on the thorns. He therefore set six very small steel traps, each baited with a mouse. On the following day two of the traps were found sprung, and the bait gone. By watching in concealment, Mr Hoy soon afterwards observed the shrike to dart down to a bait, and rise perpendicularly, but not quick enough to escape, as it was caught by two of its toes. The bird was carried alive to the house, and placed in a room,

in which a thorn bush was fixed, and some mice given to it; one of which it was observed through a hole to spit upon a thorn with the greatest quickness and adroitness."

"The specimens of the Greater Shrike, Lanius Excubitor, that have come under my observation," Mr Harley writes to me, "have been killed betwixt the autumnal and vernal equinox. I have never heard of the nest of this species being found in England, but I have known of many specimens being shot during winter. I am in the possession of a very fine male bird which was shot by George Osbaldeston, Esq. of Quomdon, out of a flock of Fieldfares."

Mr Hepburn, who had the good fortune to procure the individual from which I have taken the description of the adult male, has transmitted to me the following account of it. "On the morning of the 29th of November 1839, a labourer, A. Watt, who has a good knowledge of the birds found in this district, informed me that a strange bird, which he described, was sitting on the garden hedge. I immediately sallied forth with my gun, and carefully examined the neighbourhood, but without success. On the morning of the 3d of December, however, as I was walking along a low hedge-row, whose twigs had not yet undergone their annual switching, I observed several blackbirds hopping about, and repeating their alarm notes with much vehemence. Thinking that it might be some skulking cat or weasel, I paid no further attention to them, and was proceeding, when of a sudden, a strange bird, which I took for a kind of Thrush, sprung from the hedge, about twelve paces in advance of me. It flew directly from the fence, then wheeled to the left, and pursued its course in a parallel direction, bounding along, with an undulating flight, like that of a wagtail. Of a sudden it shot upwards to the height of six or eight feet above the line of its flight, which was nearly fourteen feet from the ground, hung in the air for fifteen seconds, moving its wings with great rapidity, and occasionally dangling its legs. Dropping down a few feet, it resumed its ordinary flight. These manœuvres were repeated several times, till it alighted on the top of a tall willow tree, in a small plantation between the stack-yard and garden.

Having contrived to reach the house, without disturbing the bird, although I passed within twenty yards of the tree, I charged my gun with a mixture of Nos. 4 and 6, and in a few minutes stood within a long range of him. But observing that his attention was fully occupied with a host of Buntings and Chaffinches hovering and diving about his head, and shrieking their alarm notes, I rapidly advanced within twenty-five yards, and brought him to the ground. Great was my joy at shooting this very rare bird, and much also, let me assure you, did I feel, when I learned that you were so well pleased with the present. On the 25th of the same month, one of the ploughmen informed me that he had observed a similar bird fly over the field in which he was at work."

In a paper entitled "Reminiscences of the Rhine," published in the Naturalist, No. IV, p. 164, is the following notice of this bird. "I can testify to the power assigned to it by some naturalists, of varying its notes, or rather imitating those of other birds. Not exactly indeed; for my first acquaintance with the Butcher-bird was occasioned by hearing notes not entirely familiar to me, though much resembling those of the Stonechat. Following the sound, I soon discovered the utterer, and while listening, to my surprise, the original notes were discarded, and others adopted of a softer and more melodious character, never, however, prolonged to any thing like a continuous song. Its grave ash-coloured garb, with its peculiar black patch on the cheek, soon convinced me that my unknown friend was the Butcher-bird, that petty tyrant of its neighbourhood, carrying on incessant warfare and wanton waste of life amongst the small fry of the Passerine Order, and whose war-cry was wont to set a host of minor warblers to flight."

Young.—The young when fledged have the bill greyish-brown, blackish toward the end; the feet blackish-brown; the upper parts brownish-grey, the tail-coverts faintly barred with dusky; the lower parts greyish-white, tinged with brown, and transversely barred with brownish-grey; the lateral band on the head brown; the wings and tail blackish-brown, marked with white as in the adult, but to a less extent.

Progress toward Maturity.—As the bird advances in age the upper parts become of a purer grey; the lower white, but seldom entirely destitute of faint traces of the transverse lines; the lateral band on the head blacker, and the wings and tail of a deeper tint. The males after the first moult resemble the adult females.

Remarks.—Several species are very closely allied to the present. Lanius meridionalis differs merely in being a little larger, in having the grey of the upper parts of a deeper tint, and the fore-neck and breast tinged with purplish-red. An American species, Lanius borealis, which has by many authors been confounded with Lanius Excubitor, may be distinguished by its greater size, by having the white on the wings and tail less extended, the bases of the primaries only, not of the secondaries, being of that colour. Even the Loggerheaded Shrike, Lanius ludovicianus, is not readily distinguished, although it possesses distinctive characters, among others the want of white at the base of the secondaries. Mr Selby's figure of Lanius Excubitor wants this white patch on the base of the *secondary* quills, it being represented only on the primary, and therefore may belong to Lanius borealis or Lanius ludovicianus. The same error has been committed by Mr Gould, in his figures of both Lanius meridionalis and Lanius Excubitor. Having examined the bird in a fresh state as well as stuffed and in skin, I am qualified to say that when the wing is closed, as represented by these authors, two contiguous patches of white are seen, one on the bases of the primaries, the other at those of the secondaries. Fig. 250.

All the species above mentioned vary considerably in summer, the lower parts being then of a purer white, the transverse lines entirely wanting, the tips of the feathers being worn off, the upper parts paler, the wings and tail more browned, and the white on the tips of the quills and tail-feathers more or less obliterated by wearing, so that many of these feathers are black at the end; and the difference appears very striking when new feathers are coming in among the old.

Genus 11. Enneoctonus. Wood-shrike.

rufus. Briss Black-backed

1 LANIUS ~~RUTILUS~~. THE WOOD~~CHAT~~ SHRIKE.

WOODCHAT. WOOD SHRIKE.



FIG. 252.

Lanius rutilus. Lath. Ind. Orn. I. 70.
Woodchat. Mont. Orn. Dict. Woodshrike. Supp.
Pie-grièche rousse. Lanius rufus. Temm. Man. d'Orn. I. 147.
Woodchat. Lanius rufus. Selb. Illustr. I. 153.
Lanius rufus. Woodchat. Jen. Brit. Vert. An. 96.

Male with the upper part of the head and the hind-neck brownish-red, the back black, the scapulars white, the rump grey, the wings black, the base of the primaries and the tips of the secondaries white, the tail black excepting the outer feathers, the basal half of the next and its tip, with those of the rest, which are white; a broad black frontal band, margined anteriorly with white; a black cheek-band; the lower parts white. Female with the head and neck dull red; the back brownish-black, the lower parts greyish-white, with transverse brownish lines. Young reddish-brown above, brownish-white with transverse lines beneath.

Black-backed Wood-

MALE.—The ~~Woodchat~~ Shrike is much inferior in size to the species last described, which it however resembles in form,

the body being moderately stout, the neck short, the head ovate; the bill short, stout, compressed toward the end, its outlines convex, the tip of the upper mandible deflected and acute, that of the lower reflected and also acute, the notch and dentiform process of the former distinct, and the gape-line slightly arched. The feet are rather small; the tarsus slender, compressed, with seven anterior scutella; the first toe with eight, the second with ten, the third twelve, the fourth also twelve scutella.

The plumage is soft and blended. There are five strong bristle-feathers at the base of the upper mandible on each side. The wings are of moderate length; the first quill nearly half the length of the second, which is a quarter of an inch shorter than the third, the latter being the longest feather in the wing, the second equal to the fifth. The tail is long, straight, and much rounded or graduated, the lateral feathers being half an inch shorter than the longest.

The bill is black, as are the feet and claws. The upper part of the head and the hind-neck are brownish-red, the anterior part of the back black, the hind part grey. The wing-coverts and quills are black, the bases of the primaries white, as are the outer scapulars, and the tips of the secondaries. The tail-feathers are black, their bases and tips white, that colour increasing outwards so as to cover the whole of the outer feather excepting a part of the shaft. A broad black band extends from the forehead over the loral space, includes both eylids, enlarges on the ear-coverts, and terminates behind them. On its lower margin before the eye is a narrow white stripe. The lower parts are pure white.

Length to end of tail $7\frac{8}{12}$ inches; bill along the ridge $\frac{7\frac{1}{2}}{12}$, along the edge of lower mandible $\frac{10}{12}$; wing from flexure $3\frac{10}{12}$; tail $3\frac{4}{12}$; tarsus $\frac{11}{12}$; first toe $\frac{4}{12}$, its claw $\frac{4}{12}$; second toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{5}{12}$; third toe $\frac{6\frac{1}{2}}{12}$, its claw $\frac{4}{12}$; fourth toe $\frac{4\frac{3}{4}}{12}$, its claw $\frac{3}{12}$.

Female.—The female has the upper part of the head and the hind-neck dull brownish-red; the black of the back tinged with brown; the rump brownish-grey, transversely barred with brown; the wings and tail brownish-black, with the white markings less extended and tinged with brown. The band on

the side of the head is brown; and the lower parts are greyish-white, the sides tinged with brown, the fore-neck and breast marked with faint semicircular brown lines, of which there are two on each feather.

Length to end of tail $7\frac{8}{12}$ inches; bill along the ridge $\frac{7}{12}$; tarsus $\frac{11}{12}$; middle toe and claw $\frac{10\frac{1}{2}}{12}$.

vi species

Habits.—The ~~Woodchat Shrike, which~~ extends as far south as the Cape of Good Hope, and is abundant in many parts of Africa, where individuals are said to reside all the year, visits the European continent in spring, and extends its migrations to Italy, France, Switzerland, and Germany, returning southward in September. It is said to resemble the next species in its habits, to frequent the hedges and sides of roads, to have a short and undulated flight, and to imitate the cries of other birds. Its food consists of insects of various kinds, as well as occasionally of small birds and quadrupeds. Mr Hoy, in Loudon's Magazine of Natural History, states that it nestles invariably in trees, preferring the oak. "The nest is fixed to the fork of a projecting branch, and is composed on the outside of sticks and wool, mixed with white moss from the bodies of the trees, and lined with fine grass and wool. Eggs four or five in number, rather smaller than those of the Red-backed Shrike, and varying much in markings; the ground colour being pale blue in some, in others a dirty white, surrounded near the larger end with a zone of rust-coloured spots; in some, again, the markings and spots are of a paler colour, and more dispersed over the egg. It is not a wild bird, often building close to houses and public roads." The same gentleman mentions two instances of its having been killed in England, near Canterbury, and in the neighbourhood of Swaffham in Norfolk. Five others are brought forward by Mr Yarrell, in his instructive and beautifully illustrated History of British Birds; so that this species is confirmed as a rare visitant in England.

Young.—The young, after the first moult, are said by M. Temminck to be "of a dull white beneath, with grey bands, reddish-brown above, with brown semilunar markings; the wings and tail blackish-brown."

2. LANIUS COLLURIO. THE RED-BACKED wood- SHRIKE.

RED-BACKED BUTCHER-BIRD. FLUSHER.

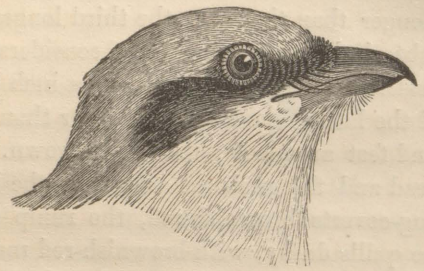


Fig. 253.

Lanius Collurio. Linn. Syst. Nat. I. 136.
Lanius Cullurio. Lath. Ind. Orn. I. 69.
Red-backed Shrike. Mont. Orn. Dict.
Pie-grièche Ecorcheur. Lanius Collurio. Temm. Man. d'Orn. I. 147.
Red-backed Shrike. Lanius Collurio. Selb. Illustr. I. 150.
Lanius Collurio. Red-backed Shrike. Jen. Brit. Vert. An. 96.

Male with the back and wing-coverts brownish-red, the crown of the head, hind-neck, and rump ash-grey, the breast and sides rose-coloured, a broad band of black from the bill to behind the ear; tail white, towards the end blackish-brown, of which colour are the two middle feathers. Female with the upper parts reddish-brown, the hind-neck tinged with grey; the lower parts greyish-white, transversely undulated with dusky.

wood-

Male.—The Red-backed Shrike, which is about the size of the Corn Bunting, and of a compact form, has the body moderately full; the head rather large; the bill short, stout, considerably compressed, its outlines convex, the tip of the upper mandible deflected, the notch and dentiform process distinct,

the tip of the lower mandible a little reflected, and the gape-line slightly arched. The feet are rather small; the first toe with eight, the second with ten, the third twelve, the fourth twelve scutella; the toes very slender; the claws of moderate length, arched, slender and sharp pointed.

The plumage is soft and blended; the bristle-feathers at the base of the upper mandible small. The wings of moderate length; the first quill one-third of the length of the second, which is three-twelfths of an inch shorter than the third, and one-twelfth longer than the fifth, the third longest. The tail is long, straight, slightly emarginate, and considerably rounded, the middle feathers being one-twelfth of an inch shorter than the next, and the latter four-twelfths shorter than the longest.

The bill and feet are black; the irides brown. The upper part of the head and the neck are ash-grey; the back, scapulars, and wing-coverts brownish-red, the rump shaded with ash-grey; the quills dusky, with brownish-red margins; most of the primaries having also a white patch at the base, of which scarcely any is perceptible without removing their coverts. The two middle feathers of the tail, and the terminal third, with the shafts of all the rest, brownish-black, the remaining parts white; excepting the two middle, they are also terminally margined with white. A broad band of brownish-black from the bill to the eye, margining both eyelids, and extending to behind the ear. The fore part of the neck and the abdomen are white; the lower part of the former, the breast and sides, tinged with rose-colour; the lower wing-coverts and tail-coverts white; the tibial feathers dusky.

Length to end of tail $7\frac{1}{4}$ inches; extent of wings 12; wing from flexure $3\frac{9}{12}$; tail $3\frac{2}{12}$; bill along the ridge $\frac{6\frac{1}{2}}{12}$; along the edge of lower mandible $\frac{8\frac{1}{2}}{12}$; tarsus $\frac{10}{12}$; first toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{4}{12}$; second toe $\frac{4}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; third toe $\frac{6\frac{1}{2}}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; fourth toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$.

Female.—The female differs considerably in colour. The bill is dark brown above, paler beneath. The upper parts are of a dull reddish-brown tint, the hind-neck and rump tinged with ash-grey, the tail of a more dingy brown, and faintly

marked with transverse dusky lines, of which some are perceptible on the back also. There is a whitish band over the eye; the auriculars are brown; the lower parts greyish-white, tinged with brown on the breast, and except the throat and abdomen, marked with curved lines of dusky brown, of which there are two on each feather.

Length to end of tail $7\frac{1}{4}$ inches; extent of wings $12\frac{1}{4}$.

Habits.—This species is not very uncommon in many districts of England, as about London and Bristol, in most of the southern counties, and many of the eastern and western, but gradually diminishes in number as we proceed northward, and has not hitherto been observed in any part of Scotland. It frequents the margins of woods, thickets, and tall hedges, as well as open downs and commons which are more or less covered with furze. It is frequently seen perched on a top twig, whence it issues in pursuit of insects, which it fixes upon the thorns, eating the soft parts, but generally leaving the thorax and elytra. It has been seen by several creditable observers to prey upon small birds, with which it deals in the same manner as the Cinereous Shrike. Messrs Sheppard and Whitear state that they once saw a male eager in chase of a Blackbird. Its flight is quick and undulated, and it frequently hovers over a spot in the manner of the Whinchat. Its ordinary note is a kind of chirp, but it has also a short modulated song, and is capable of imitating the cries of several other birds. It appears that the nest of this species is sometimes selected by the Cuckoo in which to deposit her egg. In speaking of the latter bird, the Reverend Messrs Sheppard and Whitear, in the Linnæan Transactions, Vol. XV, p. 28, state that on the 21st July 1816, they "observed a pair of Red-backed Shrikes very busy in feeding a young Cuckoo which was perched on an oak." This fact confirms Temminck's remark, who says that the Cuckoo will sometimes lay its egg in the nest of the above-mentioned Shrike. It also contradicts Montagu's, who asserts that the "Yellow-hammer's egg is larger than that of any other bird in whose nest the Cuckoo chooses to lay;" for the egg of the Red-backed Shrike is superior in size.

Mr Harley, who resides in Leicester, has favoured me with the following notice respecting this species. " The Red-backed Shrike occasionally visits us, but is more common in the counties to the westward, that is, in Shropshire, Staffordshire, Herefordshire, and Worcestershire. In July 1833, as I was walking alongside of an old hedge, near to Ganendon Park, which was composed of maple, crab, hawthorn, hazel, and stunted ash, I heard a sparrow-like note, which to me was somewhat new. This note I found proceeded from the Red-backed Shrike, who was beset with a few pairs of Titmice, Parus cœruleus and Parus ater; and a pretty loud scolding noise they were making. I could not discover that any bird, mouse, or beetle had been impaled by it, although I spent a long time in attempting to observe, if possible, that habit. The pugnacity of the Titmice is as strongly manifested against the Cuckoo, the Windhover, and the Owl, should the latter be abroad in the day-time, as it was in this instance against the Shrike. When we are desirous of seeing this species, we must wait until May comes in, and we must not then repair to the extensive wood, the leafy dell, the cultivated upland, or the barren down; but traverse the borders of the grassy mead, where the cowslip and saxifrage vie with the buttercup and ladysmock;

> ' In days when daisies deck the ground,
> And blackbirds whistle clear.'

Yes, there and then we shall meet with this bold black-eyed bird. 'Tis now the 20th of May; the oak and ash have not yet unfolded their leaves; but the fine bright foliage and delicately tinted blossoms of the crab rival in beauty those of the fantastic maple and nodding beech. The hawthorn too is putting forth its pink-eyed florets, which will soon enamel every hedge, and regale the sense. Here too beneath that overhanging spray of woodbine we perceive the Scilla nutans, drooping its modest head, and the cowled Arum in its green pavilion, keeping watch like a sentinel over the flowers around. The wood-pigeon cooes beside his mate on yon lofty beech; the wryneck with his shrill *pee-pee* is heard from the pollard ash;

the landscape glows in beauty, and nature teems with life. Hark to that sparrow-like note issuing from the stunted sloe-hedge. It is our friend the Red-backed Shrike. His black cheek and bold mien bespeak the preyer. There he sits in the very attitude of the Flycatcher. Now mark his flight, for he is on wing—a miniature windhover. He has seized his prey, a cock-chafer, and bears it to yon solitary hawthorn bush. How very singular is the flight of this Flusher: it is undulating, but the tail is kept straight out, like that of the Long-tailed Tit, the feathers being held very close together, so that an observer might imagine the bird to have only one feather in it.

"This species is very regular in its visits in certain localities, indeed nearly as regular as the Flycatcher. For instance, in the month of June in 1837, and the two succeeding years, I found its nest in an old crab pollard in Staffordshire; and the gentleman in whose grounds this nest was found assures me that a pair of these birds had a nest in the pollard for several years previous. When the bird alights, which it commonly does upon the ranpikes of an old maple or crab, or ash, it has a peculiar way of moving its tail up and down, after the manner of the Robin, or rather, may I be allowed to say, of the Magpie; and I am not certain whether this habit is not conspicuous in the Flycatcher. The bird which I noticed in the neighbourhood of Ganendon Park we shot, and on opening it we found nothing but remains of beetles, cock-chafers, and other insects. The nest is large and put together in rather a slovenly way, the outside being formed of twigs, fibrous roots, and green moss, of the same sort as that which the hedge-sparrow uses, and the lining of hair. Looking at the nest, one would take it for that of a Missel Thrush, inasmuch as a great deal of wool is inwrought amongst the twigs, around the exterior, which gives it a slovenly appearance, as I have said. I have not seen this bird after August is out, and therefore conclude that it leaves us early after the breeding season. This Shrike has a habit of perching on the topmost as well as the outside twig of a hedge or bush, so that one might at a distance take it for a Yellow or Corn Bunting."

The species is said to be found in various parts of Africa, even the Cape of Good Hope, in Italy and other portions of the south of Europe, in France, Germany, and the northern countries as far as Sweden and Norway. In the colder parts it is a migratory bird, and in England makes its first appearance in the beginning of May, seldom arriving earlier than the 10th or later than the 20th. It usually places its nest in a thick hedge or bush. According to Montagu, it is "composed of moss and fibrous roots put together with wool, and lined with hair. It lays five or six eggs, of a bluish-coloured white, with cinereous brown spots, most at the larger end; sometimes the eggs are white with dusky spots. When it has young and you approach the nest, the birds are clamorous, making a chattering noise." Two young birds which he kept chained "would come to the call for the sake of a fly, of which they were extremely fond; when raw meat was given them, they would endeavour to fasten it to some part of their open cage in order to tear it; would eat mice and small birds cut in pieces, feathers, fur, and bones, disgorging the refuse like the hawk tribe." After the young have come abroad, they keep together, and associate with their parents, until the period of their departure, which is towards the end of September.

The nest may be more particularly described as very bulky, having an external diameter of from six to seven inches, the internal three. It is composed of slender twigs, fibrous roots, and moss, with a lining of wool, and the hair of various animals. The eggs are ten and a half twelfths long, seven-twelfths in breadth, ovate, with the narrow end rounded, generally light cream-coloured, but sometimes tinged with blue, and marked with dots, spots, and small patches of reddish-brown, and pale purplish-grey, sparse on the smaller end, but collected into a broad ring towards the larger. They are very similar in colouring to those of the Grey Flycatcher and Missel Thrush.

Young.—Young birds have the upper parts dull reddish-brown; the hind-neck and rump tinged with grey, the scapulars redder with dusky tips; the quills dusky, the inner secondaries lighter, and bordered with greyish-red, within which is

a blackish line; the tail-coverts similarly marked, the tail reddish-brown, with reddish-white tips, anterior to which is a dusky line. The anterior part of the forehead, and a band over the eye, are brownish-white, mottled with dusky; the ear-coverts brown, the loral space whitish. The lower parts are greyish-white, the breast and sides tinged with red; the throat, middle of the thorax, abdomen, and lower tail-coverts unmarked, the other parts covered with dark brown undulated semicircular lines, of which there are two on each feather.

Progress toward Maturity.—After the first moult, the young have the plumage marked as in the adult female; the males having the colours brighter. It has been suggested by Mr Yarrell that the female ultimately resembles the male, as is the case with our other species. This opinion has originated from the remarks of Mr Hoy and Mr Blyth. The former, in Loudon's Magazine, Vol. IV, p. 344, says, "I have a female bird of the red-backed species, in the full garb of the adult male. I had found the nest, and observed near the spot apparently two male birds. Not being able to discover the female, I was induced to shoot both; and, on dissection, one proved the female, with the eggs much enlarged, and one nearly ready for exclusion." The latter, in the same useful repertory of facts relative to British birds, Vol. VIII, p. 364, mentions his having fallen in with a nearly similar individual. "It was a female, partly in the male plumage; but the ovaries were perfect, and contained eggs; and it was in company with a partner of the other sex at the time it was shot."

After Hirundininæ.

Tyranninæ. Tyrannine.
~~Muscicapinæ. Muscicapine.~~

Family II ~~MYIOTHERINÆ.~~

Tyrants ~~FLYCATCHERS~~, *AND ALLIED GENERA.*

THE extensive family ~~of the Myiotherinæ~~, of which species are found in all the warm and temperate parts of the globe, has in Britain only two representatives, the Grey and the Pied Flycatchers, which in form are so closely allied to many species of the Sylvianæ, that a person unacquainted with the more remarkable exotic genera might naturally conceive it to be quite unwarrantable to refer them to a family distinct from the Warblers. If we compare Muscicapa grisola with Sylvia atricapilla, these birds being nearly of the same size, we find that the differences presented by their bills are extremely slight, the one having that organ merely a little broader at the base and less compressed at the end than the other, that their plumage is precisely similar in texture, their wings and tail scarcely different in any appreciable degree, and their feet of the same form, although those of the Flycatcher are very much smaller, and in fact so singularly diminutive as to remind us of those of the Swallows. But if we bring together specimens of various species of this group, we find that considered collectively they may with propriety be viewed as constituting a family, possessing decided characters, of which it will suffice here to indicate the more prominent.

The family of ~~Myiotherinæ~~ Muscicapa Tyranninæ then is composed of birds generally of small size, none of them being so large as a Jackdaw, while some are extremely diminutive. Their bill, Fig. 254, is straight, of a tapering form, but depressed or flattened, it being much broader than high at the base, and generally compressed only just at the tip. The upper mandible has its dorsal outline declinato-convex, the ridge narrow and distinct, the sides sloping and becoming more convex toward the end, the edges sharp

and deflected, the tip very narrow, deflected, and generally curved over that of the lower, the notch very small or reduced to a slight sinus. The lower mandible has the angle moderately long, wide, and rounded, the back flattened or convex, the dorsal outline slightly ascending and nearly straight, the sides sloping outwards, flat at the base, convex towards the end, the edges sharp and a little inflected; the gape-line straight. Although often very large, the bill is very light, the bony parts being very thin, and the horny little more than a membrane.

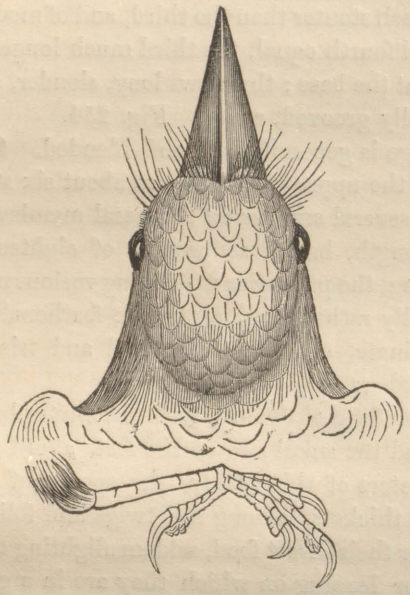


Fig. 254.

The mouth is wide; both mandibles internally moderately concave, with a central prominent line; the palate flat; the posterior aperture of the nares linear, and margined with rather large papillæ. The tongue, Plate XXII, Fig. 2, *a*, triangular, flat, emarginate and papillate at the base, the tip slit and lacerated. The œsophagus, *b c d*, gradually contracts at the top, and is then of nearly uniform diameter; the stomach, *d e*, is a roundish or broadly elliptical moderately compressed

gizzard, with the muscles of moderate size, but not compressed on the edges of the organ; the intestine, *efgh*, short, rather wide, with two minute cœca near the extremity, which has a large pyriform dilatation.

The eyes are of moderate size, the eyelids feathered. The external aperture of the ear very large, elliptical. The nostrils very small, elliptical or roundish, in the anterior part of the broad nasal membrane. The hind limbs are very small; the tarsus very short and slender, moderately compressed or roundish, with seven anterior scutella; the toes small, much compressed, the first not much stouter than the third, and of moderate length, the second and fourth equal, the third much longer, and united to the fourth at the base; the claws long, slender, arched, compressed, laterally grooved, acute. Fig. 254.

The plumage is generally soft and blended. On each side of the base of the upper mandible are about six strong bristle-feathers, and several smaller on the nasal membrane. Wings of moderate length, broad, semiovate, of eighteen quills, the secondaries long, the primaries presenting various modifications.

Tail generally rather long, of twelve feathers, and in some degree emarginate, sometimes flattened and triangular, with the lateral feathers very long.

The peculiar form of the bill, with the strong bristle-feathers at its base, and the small size of the feet, afford the most prominent characters of this family, the species of which reside in woods and thickets, among the twigs and foliage of which they search for their insect food, seldom alighting on the ground, for walking or leaping on which they are in a great measure incapacitated by the structure of their feet. Very frequently they take a station on a twig, from whence they sally forth after passing insects. The larger species also attack and prey upon smaller birds, and are of a very bold and quarrelsome disposition, defending themselves and their young from birds of prey with great courage. The smaller species are of a more quiet temper, confine their destructive powers to insects, and in general resemble the Sylviæ in their manners.

This family presents various affinities, passing on one hand into that of the Shrikes, on the other into that of the Sylviinæ.

The genera of which it is composed are Muscicapa, Riphidura, Myiagra, Myiothera, Tyrannus and several others. The last-mentioned genus, peculiar to the warm regions of America, is that which I consider as uniting the peculiar characters of the family in the most obvious manner, and consequently that whose name must be applied to it.

When the Flycatchers or Muscicapæ formed a single genus, one of them bore the name of Muscicapa Tyrannus, partly on account of its domineering temper, and partly because of the bright spot on its head, which was fancifully compared to a regal diadem. This species and many others having similar characters have been formed into a genus, to which the name Tyrannus (Tyrant or King) has been given. But to this mode of naming birds I have already objected. The species of this family are eminently Flychasers, Myiotheres, as Vieillot has called them, and although Myiothera has been applied by Illiger to a genus of the Antcatchers, I think Vieillot has done well in altering it to Myrmothera. It thus remains free to be applied to the genus Tyrannus of authors, which being apparently the most typical or characteristic, gives its name to the family.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. MUSCICAPA. FLYCATCHER.

Bill of moderate length, straight, broad at the base, gradually compressed toward the end: upper mandible with a very small notch close to the small deflected tip; head rather large, ovate, depressed; body rather slender, feet short; tarsus very short, slender, with six or seven very broad scutella; toes small; claws rather long, very slender, acute, arched; plumage blended; wings long, the second and third quills longest; tail long or of moderate length, even or emarginate.

1. *Muscicapa grisola. Grey Flycatcher.*—Upper parts brownish-grey, lower white, the head and breast spotted with brown.

2. *Muscicapa luctuosa. Pied Flycatcher.*—Upper parts black, the forehead, a patch on the wing, part of the tail, and all the lower parts, white. Female dusky brown above.

Genus I. MUSCICAPA. FLYCATCHER.

The Flycatchers constitute one of those genera of the ~~Myiotherinæ~~ most nearly allied to the Sylviinæ, and distinguished by the following characters :—Bill of moderate length, straight, broader than high at the base, becoming gradually compressed toward the end, the ridge rather sharp, the sides sloping, flat at the base, but convex toward the tip, which is narrow, a little declinate, with the notch very obscure ; lower mandible with the angle of moderate length and rather wide, the back a little flattened at first, but afterwards narrow, the sides sloping outwards, flat on the crura, convex towards the end, the edges a little involute, the tip straight and sharp ; the gape-line straight.

The mandibles are internally moderately concave, with a central prominent line, the upper with a slight groove on each side, the palate flat ; the posterior aperture of the nares linear, edged with rather large acute papillæ, and having a small round knob at its anterior extremity. The œsophagus rather wide at the top, afterwards of nearly uniform breadth ; the proventriculus a little wider, with numerous rather large short glandules. The stomach is a broadly elliptical gizzard, with moderate lateral muscles, rather small tendons, and an inner tough and broadly rugous coat. The intestine is short, rather wide, with two minute cœca near the extremity ; the rectum dilated behind.

The nostrils are elliptical, pervious, in the fore part of the large nasal membrane, which is feathered at the base. The eyes are small, the eye-lids feathered. The aperture of the ear elliptical, and very large.

The general form is slender ; the body ovate ; the neck short ; the head of moderate size, broadly ovate, rather rounded above. The feet are short and feeble ; the tarsus very short, slender, compressed, with the seven anterior scutella generally blended, excepting the lower two or three ; the toes small and com-

pressed, the hind toe not much stronger than the second, the lateral toes equal, the third much longer; the claws rather long, arched, extremely compressed, and very acute. Fig. 256.

The plumage is soft and blended, the feathers ovate, with the filaments loose towards the end. Several long stiff bristles at the base of the upper mandible on each side, and a series of shorter bristles along the upper edge of the nasal membrane. Wing rather long, broad, semiovate, rather pointed, with eighteen quills, of which ten are primary or manual, the first not half the length of the second, the latter and the third longest; the primaries tapering but rounded, the secondaries broadly and abruptly rounded. The tail is of moderate length, straight, even or a little emarginate, of twelve rounded feathers of moderate breadth.

Species of this genus occur in the warmer and temperate parts of the old Continent, a few migrating in summer into the northern regions. Their food consists of insects, which they frequently or generally seize on wing, launching in pursuit of them from an elevated station to which they return. But they also search the ground, on which however they do not walk with ease, their progression there being by short hops. Their flight is quick and light; they are expert at executing rapid turns; and in flying to a distance they move in an undulatory manner. Their nests are of moderate size, neatly constructed of straws, fibrous roots, and similar materials, and lined with hair or feathers. The female seldom differs much from the male in colour, and their attire is not generally gaudy.

Two species occur in Britain, both summer birds.

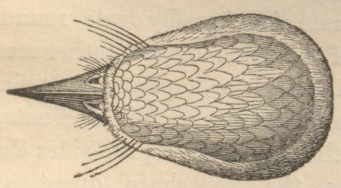


Fig. 255.



Fig. 256.

1. MUSCICAPA GRISOLA. THE ~~SPOTTED~~ GREY FLYCATCHER.

SPOTTED FLYCATCHER. ~~GREY FLYCATCHER~~. BEE BIRD. CHERRY CHOPPER.



FIG. 257.

Muscicapa Grisola. Linn. Syst. Nat. I. 328.
Muscicapa Grisola. Lath. Ind. Orn. I. 467.
Spotted Flycatcher. Mont. Orn. Dict.
Gobe-mouche gris. Muscicapa Grisola. Temm. Man. d'Orn. I. 152.
Spotted Flycatcher. Muscicapa Grisola. Selb. Illustr. I. 141.
Muscicapa Grisola. Spotted Flycatcher. Jen. Brit. Vert. An. 97.

Upper parts brownish-grey, the head spotted with brown; lower parts white, the neck and fore part of the breast streaked with greyish-brown.

Grey or

MALE.—The Spotted Flycatcher is about the size of the Meadow Pipit, or the Black-capped Warbler, and of an equally slender form, the body ovate and a little compressed, the neck rather short, the head of moderate size, broadly ovate, rounded above. The bill is straight, of moderate length, rather stout, depressed or broader than high at the base, tapering to a point; the upper mandible with its dorsal outline slightly declinate, a little convex towards the end, the ridge narrow, the sides sloping and towards the end convex, the edges sharp, direct, and overlapping, the tip very narrow, slightly declinate, the notch reduced to a slight sinus; the lower mandible has the angle rather short, wide, and rounded, the dorsal outline ascending

and slightly convex, the sides at the base sloping outwards and concave, towards the end convex, the back broad and flattened, but towards the end narrow, the edges sharp and sloping outwards; the gape-line straight. Both mandibles are internally slightly concave, with a central prominent line, the upper with a groove on each side for the edges of the lower; the palate is flat; the posterior aperture of the nares linear, margined in its whole length with rather large papillæ. The tongue, Plate XXII, Fig. 2, *a*, five and a half twelfths long, flat, deeply emarginate and finely papillate behind, ciliated on the edges at the base, the tip slit and lacerated, the points very slender. The œsophagus, *b c d*, is two inches in length, of nearly uniform diameter, its average width two twelfths. The stomach, *d e*, is seven twelfths long, six broad, moderately compressed, its lateral muscles of moderate thickness, its tendons rather small, the inner coat thin and broadly rugous. The intestine, *e f g h*, is six inches long, rather wide, having a diameter of from two twelfths to one; the cœca, *g*, extremely small, cylindrical, a twelfth long, and ten twelfths of an inch distant from the extremity.

The nostrils are elliptical, open, perforated, in the fore part of the large nasal membrane, which is anteriorly bare, one twelfth of an inch long. The eyes are small, their aperture two twelfths. That of the ear elliptical, very large, nearly three twelfths. The feet are very small and slender; tarsus very short, compressed, anteriorly with six scutella, acute behind; the toes very small; the hind toe not stouter than the third, and with its claw equal to the second and fourth, the third much longer; the first with eight, the second with ten, the third thirteen, the fourth twelve scutella. Claws of moderate length, rather strong, extremely compressed, moderately arched, acute.

Plumage very soft, blended, the feathers ovate, with the filaments free at the end, and a very slender long plumule of few barbs. There are five long, stiffish bristle-feathers on each side at the base of the upper mandible, and several small ones on the nasal membrane. Wing of moderate length, broad, semiovate, rather pointed, with eighteen quills, of which ten

are primary; the first about a fourth of the length of the second, which is longest, but scarcely exceeds the third, the fourth three twelfths of an inch shorter, the other primaries slowly graduated, all rounded; the secondaries long and abruptly rounded; the third and fourth primaries slightly cut out on the outer web at the end. The tail is of moderate length, straight, emarginate, the feathers rounded. This species is remarkable for having, like the Robin, some Thrushes and other birds, a few filaments protruding from among the feathers of the nape. They are tipped with six barbs.

The bill is black, the base of the lower mandible deep flesh-colour, its edges lighter; the tongue and soft palate orange, the horny part of the mouth dusky. The iris is dusky; the feet brownish-black. The general colour of the upper parts is a light brownish-grey, the rump more tinged with brown, the head spotted with dusky-brown; the quills, coverts, and tail-feathers dusky, margined with light greyish-brown. The loral space and marginal feathers of the eyelids are brownish-white, the ear-coverts greyish-brown. The lower parts are greyish-white, the neck and fore part of the breast streaked with greyish-brown, the sides light reddish-brown, as are the axillar feathers, and lower wing-coverts; the lower tail-coverts with the central part brown.

Length to end of tail $6\frac{2}{12}$ inches; extent of wings $10\frac{1}{4}$; wing from flexure $3\frac{1}{4}$; tail $2\frac{7}{12}$; bill along the ridge $\frac{7\frac{1}{2}}{12}$, along the edge of lower mandible $\frac{10}{12}$; tarsus $\frac{7}{12}$; first toe $\frac{3}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; second toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{2}{12}$; third toe $\frac{5}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; fourth toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$.

Female.—The female is a little less, but in colour differs so little that one can hardly distinguish her without dissection.

Length to end of tail 6 inches; extent of wings 10; bill along the ridge $\frac{6\frac{1}{2}}{12}$; tarsus $\frac{7}{12}$; middle toe and claw $\frac{7\frac{1}{2}}{12}$.

Variations.—I have met with no other variations than a slight difference in the tints of the upper parts, and in the darkness and size of the streaks on the lower parts, which are sometimes extended over the whole of the thorax.

Changes of Plumage.—This bird arrives in full plumage, with the feathers entire. As the season advances, the tips of the feathers are abraded, when those of the head become pointed and the brown spots then are more apparent; the upper parts in general become paler, and the light margins of the quills narrower.

Habits.—The ~~Spotted~~ Grey Flycatcher arrives from the middle to the end of May, and is generally distributed both in England and Scotland, but is less common in the latter country, although in some districts there it is by no means scarce. It occurs only in wooded parts, frequenting plantations, low bushy hollows, orchards, and gardens. Its flight is rapid and undulated, but it is seldom observed to fly to a great distance. It glides among the twigs in pursuit of insects, perches with ease on trees, walls, and other eminences, sometimes settles on the ground, where it moves by short leaps, and may often be seen making excursions on wing from a tree in the manner of the Chats and Redstart, and returning to its station, to sally forth again when an insect passes near. This is its favourite mode of seizing its prey, which consists exclusively of insects of various kinds. In August and September, when its young have come abroad, it accompanies them into the woods, and continues there until its departure, which takes place in the beginning of October. On the 5th of September 1832, I met with a large flock of these Flycatchers in a fir wood about five miles below Tushielaw in Ettrick; but, from the few opportunities which I have had of observing them late in the season, am unable to say whether they usually collect in numbers previous to their departure. On this occasion they were searching for food on the ground, among the moss and decayed leaves, and betook themselves to the trees only on being disturbed. This circumstance was no doubt owing to the vast number of insects, and especially of ants, which swarmed on the ground; but in general the Flycatcher is not apt to betake itself to such a mode of feeding. It is pleasing to watch it when it has stationed itself on a twig, whence, on the approach of an insect, it glides after it, and having seized it with a snapping noise, returns to the same or

a neighbouring station, to watch its prey. This is the characteristic action of all the Myiotherinæ, but, of course, is not absolutely peculiar to them, various allied species of the Sylviinæ exhibiting the same artifice.

The nest is placed in a hole of a wall or tree, or on a branch, especially of a fruit tree, or of ivy, against the wall, in which latter case it is usually incomplete at the back part, the inner layer however being perfect. It is small, compact, and hemispherical, its greatest diameter measuring four and a half inches, the inner two and a quarter. The exterior is composed of moss, straws, and fibrous roots; within which is a layer of finer straws, moss, and hair; while the interior is composed of feathers, generally of domestic birds. The eggs, four or five in number, are of a longish oval form, nine-twelfths of an inch in length, six and a half twelfths in breadth, bluish-white, or very pale greyish-blue, clouded and spotted with light brownish-red and purplish-grey, the markings more numerous toward the larger end. They are very similar to the eggs of Lanius Collurio, although much smaller, being about equal in size to those of the Redstart.

My friend Mr Durham Weir, whose observations regarding the feeding of Thrushes have already been recorded in the second volume of this work, having instituted a similar investigation of the habits of this species, has communicated to me the results. "Boghead, 22d December 1837.—'The Spotted Flycatcher is rare in Scotland, if indeed it at all reaches that country.' So says Mr Mudie in his Feathered Tribes of the British Islands, Vol. I, p. 240. In this neighbourhood three or four pairs make their annual appearance. In my garden a male and a female have nestled for twelve successive years. Upon the lowest branch of one of the wall trees, at seven o'clock on Thursday morning, the 22d of June 1837, I observed them begin to build their nest. Its construction occupied them little more than a day and a half, for early on Friday afternoon it was finished. On Thursday the 27th the female began to sit upon four eggs, and on the 24th of July the young were ripe. Next day I made the following observations, it being very warm and sunny. At twenty-five minutes before four o'clock, they com-

menced feeding their young. From that time until four o'clock, they fed them ten times; from four to five o'clock, sixteen times; from five to six o'clock, twenty-eight times; from six to seven o'clock, twenty-nine times; from seven to eight, thirty-four times; from eight to nine, forty times; from nine to ten, thirty-nine times; from ten to eleven, thirty-five times; from eleven to twelve, forty-four times; from twelve to one, forty times; from one to two, thirty-three times; from two to three, forty-eight times; from three to four, thirty-seven times; from four to five, thirty-eight times; from five to six, twenty-one times; from six to seven, sixteen times; from seven to eight, twenty times; and from eight to ten minutes before nine o'clock, they fed them nine times. They thus fed their young in the course of the day five hundred and thirty-seven times. Their motions were so uncommonly rapid, that I could not for a single moment keep my eye off the nest. Before they fed their young, they alighted upon a tree for a few seconds, and looked round about them. By short jerks they usually caught the winged insects. Sometimes they ascended in the air, and dropped like an arrow; at other times they hovered in it like a hawk, when set on its prey. They beat off most vigorously all kinds of small birds that approached their nest. It is impossible to give the precise number of flies that might have been consumed by their brood, as they sometimes brought to them one large fly, at other times two, three, four, five, and even more flies of different sizes."

Young.—The young when fledged have the bill light brown, with its basal margins yellow, the feet greyish-brown, and the claws dusky. The upper parts are dull yellowish-grey, the feathers edged with dusky; the wing-coverts, quills, and tail-feathers chocolate brown, the former tipped, and the latter margined with pale brownish-red. The sides of the head, and the fore part of the neck are reddish-white, the feathers tipped with dusky, the breast and belly greyish-white, the sides faintly marked with dusky.

Progress toward Maturity.—At the first moult in August and September the plumage assumes the colours of the adult.

2. MUSCICAPA ~~LUCTUOSA~~ Atricapilla. THE PIED FLY-CATCHER.



FIG. 258.

Muscicapa Atricapilla. Linn. Syst. Nat. I. 396.
Muscicapa Atricapilla. Gmel. Syst. Nat. I. 935. Adult Male.
Muscicapa Atricapilla. Lath. Ind. Orn. I. 467. Adult Male.
Pied Flycatcher. Mont. Orn. Dict. and Supp.
Motacilla Ficedula. Gmel. Syst. Nat. I. 936. Young and Female.
Sylvia Ficedula. Lath. Ind. Orn. II. 517. Female and Young.
Gobe-mouche bec-figue. Muscicapa luctuosa. Temm. Man. d'Orn. I. 155.
Pied Flycatcher. Muscicapa luctuosa. Selb. Illustr. I. 143.
Muscicapa luctuosa. Pied Flycatcher. Jen. Brit. Vert. An. 97.

Male with the upper parts black; part of the forehead, a patch on the wing, and the outer webs of the two outer tail feathers on each side, as well as all the lower parts, white. Female greyish-brown above, brownish-white beneath.

was not known until recently

MALE.—The Pied Flycatcher, which, like the Grey, is a summer bird in Britain, is much more uncommon there than that species, and ~~does not appear~~ to extend to Scotland, although it has been found as far north as the Border counties of England. It is considerably smaller, but much more beautiful than its British congener, which it resembles in its proportions. The bill is shortish, straight, slender, a little broader than high at the base, compressed beyond the middle; the upper mandible with its dorsal outline slightly declinate, a

little convex towards the end, the ridge narrow, the sides sloping at the base, convex toward the end, the tip slightly decurved, the notch reduced to a slight sinus; the lower mandible with the angle of moderate length and rather wide, the dorsal outline ascending and rather convex, the tip narrow. The nostrils are elliptical, in the fore part of the rather large nasal membrane, which is feathered at the base. The feet are very small and slender; the tarsus short, compressed, anteriorly with a long plate and two scutella, acute behind; the toes very small; the hind toe rather stouter than the third, and with its claw longer than the second and fourth; the claws rather long, extremely compressed, arched, acute.

Plumage very soft and blended, the feathers ovate. There is a row of long stiffish bristle-feathers on each side at the base of the upper mandible, and several smaller ones on the nasal membrane. Wing of moderate length, broad, semiovate, with eighteen quills; the first about a third of the length of the second, which is shorter than the third, and equal to the fifth, the third longest. The tail of moderate length, straight, emarginate, and laterally rounded.

The bill, feet, and claws are black; the iris hazel. The upper parts, including the sides of the head, are greyish-black, the rump tinged with brownish-grey; a patch on the forehead white; the quills brownish-black; the secondary coverts and inner secondary quills broadly margined with white, that colour including the whole of the three inner excepting the tips; the bases of all the quills except the outer three white; the tail-feathers brownish-black; the outer two feathers on each side with the outer web and part of the inner white, the next with a small part of the outer web of the same colour; the whole under surface, including the throat, white.

Length to end of tail $5\frac{1}{4}$ inches; extent of wings 8; wing from flexure $3\frac{2}{12}$; tail $2\frac{3}{12}$; bill along the ridge $\frac{5\frac{1}{2}}{12}$, along the edge of lower mandible $\frac{8}{12}$; tarsus $\frac{8}{12}$; first toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{3}{12}$; second toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; third toe $\frac{5\frac{1}{2}}{12}$, its claw $\frac{3}{12}$; fourth toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$.

Female.—The female is scarcely smaller, and differs in want-

ing the white patch on the forehead, and in having the upper parts hair brown, the lower dull white.

Length to end of tail $5\frac{1}{12}$ inches; wing from flexure $3\frac{1}{12}$; tail $2\frac{3}{12}$; bill along the ridge $\frac{5\frac{1}{2}}{12}$; tarsus $\frac{8}{12}$; middle toe $\frac{5\frac{1}{2}}{12}$, its claw $\frac{3}{12}$.

Habits.—This species is in form and proportions nearly as much a Sylvia as a Flycatcher, being more especially allied to the Redstart and others of that group. It arrives from the middle to the end of April, and appears to be more abundant in Cumberland and Westmoreland than in the other counties. Up to 1813, when the Supplement to Montagu's Dictionary appeared, very little was known as to the habits of this bird, all that is related by that excellent ornithologist being as follows. "As it rarely makes its appearance in the southern parts of the island, it may be inferred to be a northern species, and probably indigenous rather than merely a summer visitant. But being a local species, which never has been plentiful, and seems to be diminishing, this point has not been ascertained. The Rev. Mr Dalton of Copgrove, in the West Riding of Yorkshire, had transmitted a pair shot in his neighbourhood, in which there was no material distinction between the sexes, except that the female was rather less bright in the black parts of the plumage; but subsequent observations do not agree with this, for the female has been found to differ materially in colour. A nest and eggs were taken in the beginning of May 1811, in the same county, and transmitted by Mr Dalton. The nest was taken from a hole in a tree; it is composed of dry leaves intermixed with broad pieces of the interior bark of some tree, and a little hay, with a few long hairs, and three or four feathers form the lining. The materials are so coarse, and destitute of wool or other substances capable of connecting the parts, that it scarcely holds together, evidently bespeaking that it had been taken from the situation described. The eggs are five in number, of a very pale blue, about the size and colour of those of the Redstart, but rather paler. The nest is very different from that of the Redstart, which is more compact, and formed of moss, plentifully lined with hair and feathers; where-

as in the Flycatcher's nest now before us, there is not a single sprig of moss." The alleged differences in the tints of the plumage, some being "said to be mixed with grey on the upper parts, or spotted with white on the rump or upper tail coverts; others having white on the three exterior feathers of the tail; and some having only the outer feather marked with white," were not accounted for or properly described; and as the "young birds at first resemble the female, and in their change of plumage the males have all the intermediate shades from brown to black, this has probably given rise to an opinion that the male changes his plumage in the winter, and becomes like the female."

A Carlisle correspondent in the Magazine of Natural History, Vol. III, 173, gives the following succinct account of it. "The migration of this species appears to be principally confined to the northern counties, as it is seldom observed beyond Yorkshire, and rarely seen in the south of England, although it has occasionally been met with in Norfolk, Suffolk, Middlesex, Surrey and Dorsetshire. In some parts of Westmoreland it is very plentiful, especially in the beautiful and extensive woods surrounding Lowther Castle, the magnificent and princely residence of the Earl of Lonsdale, where we have seen it in very great numbers, and where it has bred unmolested and almost unknown for years. On the contrary, we have reason to think it has not resorted to the vicinity of Carlisle more than five or six years, and, as far as we have yet been able to ascertain, only to one locality, where it is evidently upon the increase. In this situation the males generally arrive about the middle of April, the females not until ten or fifteen days afterwards. They commence nidification early in May, and the young are excluded about the first or second week in June. We have hitherto invariably found their nests in the hole of a tree, sometimes at a considerable height, occasionally near the surface of the ground, and, for two successive years, in the stump of a felled tree. In texture and formation, the nest is very similar to those of the Greater Pettychaps, Blackcap, and White-throat, being only slightly put together, composed almost entirely of small fibrous roots and dried grass, always

lined with a little hair, and generally a few decayed leaves on the outer side, but entirely without moss. Their eggs vary in number: we have found their nest with five, six, and now and then with seven; their colour a pale green; and they so greatly resemble the eggs of the redstart, that it is frequently very difficult to distinguish them, unless contrasted together: they are, however, far from being so elegantly made, of a rounder form, and rather less, weighing from 23 to 30 grains. The males, soon after their arrival, should the weather be at all favourable, will frequently sit for a considerable time on the decayed branch of a tree, constantly repeating their short, little varied, although far from unpleasing song, every now and then interrupted by the pursuit and capture of some passing insect. Their alarm note is not very unlike the word *chuck*, which they commonly repeat two or three times when approached, and which readily leads to their detection. The manners and habits of the pied flycatcher have considerable affinity to those of the redstart; they arrive about the same time, associate together, and often build in the same holes, for which they will sometimes contend. On one occasion we found a dead female redstart in the nest of a pied flycatcher containing two eggs; and at another time, when both those species had nests within a few inches of each other, upon the redstart's being removed, the female redstart took forcible possession of the flycatcher's nest, incubated the eggs, and brought up the young."

It may seem somewhat strange that this species should not have been met with in any part of Scotland. On the Continent it extends northward as far as the middle parts of Germany, and is abundant in the countries bordering on the Mediterranean. The nest is said to be loosely constructed of fibrous roots, grass, dry leaves, and hair, the latter with some fine grass forming the lining. The eggs, six or eight in number, are pale blue, about eight and a half twelfths in length, rather broadly oval, their greatest breadth being somewhat more than half an inch.

Young.—The young, which are hatched in the beginning of June, are when fledged similar to the female.

Family III. AMPELINÆ. Ampeline.

CHATTERERS AND ALLIED SPECIES.

The birds of which this group is composed present in combination so many characters individually representative of other groups, that although their affinities may easily be traced to a considerable extent, it is difficult to assign them a precise station in a methodical arrangement. If we examine a Pipra, the species named gutturosa, for example, and compare it with a Parus of the same size, Parus ater, for instance, we cannot fail to perceive that the transition from one genus to the other is almost direct, the general form, the feet, the wings, the plumage, and even the style of colouring, presenting a remarkable similarity. The greatest difference is in the bill, which in Pipra is much broader, with the outline of the upper mandible more curved, its ridge more narrow, and its sides more slanting and flattened. These latter particulars are in a remarkable degree repeated in the species of the genus Bombycilla, which forms part of a group composed of the genera Ampelis, Procnias, Calyptomena, and Casmarhynchus, having in their widened mouth, somewhat triangular bill, and small feet, an obvious relationship to the Myiotherinæ or Flychasers. Tyrannine? Whatever may be the exact place of the Ampeline they ~~Whether the Ampelinæ should be considered as forming part of the order Cantatores, or of that of Myiotherinæ, it is thus difficult to determine.~~ They are generally regarded as chiefly frugivorous, and the only species which visits us is decidedly so in the winter season at least; but so are many ~~Cantatores, the Thrushes for example, and many Myiotherinæ~~, even the common Grey Flycatcher; and, although the bird usually named the Bohemian Chatterer may not very much resemble the species just named, I think it may be placed next to it as well as in proximity to a Thrush or a Tit. ? The Tyrannine

In their general form the Ampelinæ are rather full and com-

pact, with a short neck, an oblong head of moderate size, small feet, and blended plumage. The bill is always shorter than the head, broad at the base, and presenting a triangular form when viewed from above or beneath; the upper mandible with its dorsal outline decurved, its ridge narrow, the sides sloping, the edges direct, the tip small and deflected, with small but distinct notches; the lower mandible smaller, with the angle wide, the dorsal line slightly convex, the sides rounded, the edges rather inflected, the tip very narrow. The tarsi are generally short; the toes small or of moderate size, the first strongest and considerably larger than the lateral, of which the outer is a little longer, the soles flattened. The claws are of moderate size, well curved, compressed, laterally grooved, very acute. The wings are of moderate length, or rather long, generally concave, with nineteen quills. The tail short, or moderate, of twelve feathers, which are a little arched. The plumage is various, generally blended, and often highly coloured.

The Ampelinæ are chiefly natives of warm climates, especially of those of America. Their principal food consists of soft fruits and insects, but their habits are little known.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. BOMBYCILLA. WAXWING.

Bill short, rather stout, broad at the base, gradually compressed toward the end; upper mandible with the dorsal line convex and declinate, the ridge narrow, the sides sloping and convex, the edges sharp and overlapping, the tip deflected, narrow, and rather acute, the notches distinct; lower mandible with the dorsal line convex and ascending, the edges inflected, the tip very small, acute, ascending. Toes and claws moderate; the latter arched, compressed, acute. Wings rather long, broad, and pointed. Tail of moderate length, even.

1. *Bombycilla garrula. Black-throated Waxwing.* Upper parts light greyish-brown, forehead brownish-orange; throat black, lower tail-coverts yellowish-red; oblong vermilion appendages to the quills.

Genus I. BOMBYCILLA. Briss. WAXWING.

Only three species of this genus are known, which agree in presenting the following characters:

Bill short, straight, broad at the base, compressed toward the end: upper mandible with its dorsal line convex and declinate, the ridge narrow, the sides sloping and anteriorly convex, the edges sharp and overlapping, the notches distinct, the tip small, declinate, rather acute; lower mandible smaller, with the angle wide, the dorsal line convex and ascending, the sides convex, the edges sharp and somewhat inclinate, the tip acute and slightly ascending, with a small sinus; the gape-line straight.

Mandibles moderately concave; palate with three slight longitudinal ridges anteriorly, covered behind with papillæ; tongue short, triangular, sagittate and papillate at the base, concave above, with the tip horny and deeply slit; mouth wide. Œsophagus very wide, enlarged about the middle; stomach small, moderately muscular, roundish, with a dense, longitudinally rugous, epithelium; intestine short and excessively wide; cœca very small, oblong; rectum wider, and very short. The œsophagus resembles that of the Deglubitores; the tongue, mouth, stomach and intestine, those of Swallows and Flycatchers. Pl. XXII, Fig. 3.

Nostrils large, oval, partly concealed by the reversed feathers. Eyes of moderate size. Body moderately full, neck short, head ovato-oblong. Legs short and moderately stout; tarsus short, compressed, with seven scutella; toes of moderate size, first stout and broad beneath, outer slightly adherent at the base, and a little longer than the inner. Claws moderate, arched, compressed, laterally grooved, acute.

Plumage very soft and blended, with little gloss. Head with a conspicuous tuft. Wings rather long, pointed, of nineteen quills; primaries graduated, the first and second longest;

secondaries abruptly rounded, with the shaft prolonged into a narrow oblong coloured horny expansion, Fig. 259. Tail of moderate length, slightly rounded or even, of twelve rather narrow obliquely rounded feathers.

The Waxwings, so named on account of the alar appendages, which in colour resemble red sealing wax, belong to the arctic regions of both continents, whence they advance southward when the cold becomes severe. In winter, they feed chiefly on berries, but in summer are said to live on insects.

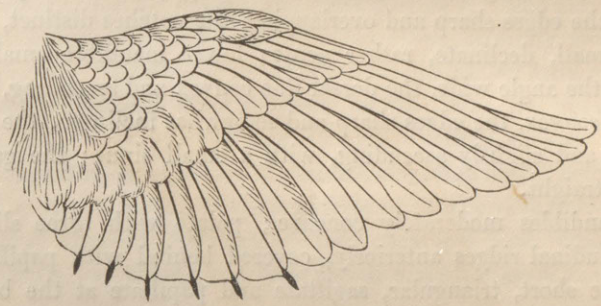


Fig. 259.

1. BOMBYCILLA GARRULA. *Linn.* THE BLACK-THROATED WAXWING.

BOHEMIAN CHATTERER.



Fig. 260.

Ampelis Garrulus. Linn. Syst. Nat. I. 297.
Ampelis Garrulus. Lath. Ind. Orn. I. 363.
Bohemian Chatterer. Mont. Orn. Dict.
Grand Jaseur. Bombycivora garrula. Temm. Man. d'Orn. I. 124.
Bohemian Wax-wing. Bombycilla garrula. Selb. Illustr. I. 268.
Bombycilla garrula. Bohemian Wax-wing. Jen. Brit. Vert. An. 125.

General colour of the plumage light greyish-brown, shaded behind into ash-grey; forehead and lower tail-coverts brownish-orange; throat and a band from the nostrils to the occiput black; primary coverts tipped with white; primaries with a yellow, secondaries with a white spot, at the end of the outer web; tail greyish-black, tipped with yellow.

Male.—This lovely bird, which rarely makes its appearance in our country, and then only in winter, is nearly equal in size to the Song Thrush, and much exceeds the Carolina Waxwing, which is coloured nearly in the same manner. The principal features have been described in the generic character. There are no bristles at the base of the bill; the feathers on the fore part of the head, forming the tuft or crest, are linear-oblong, slightly decurved, with loose filaments, the largest an inch and a quarter in length; the other feathers generally are ovato-oblong; and the plumage is blended, extremely soft, with a slight gloss, not approaching to silky. The wings are of moderate length, broad, pointed, with the first quill longest, the second scarcely shorter, the other primaries regularly graduated; all the secondaries, except the inner two, are obliquely rounded, and terminated by a narrow oblong expansion of the prolonged shaft, of the colour of red sealing-wax. The tail is of moderate length, even, or very slightly emarginate, the middle feathers being a twelfth of an inch shorter than those next the lateral.

The tongue is triangular, five twelfths long, sagittate and papillate at the base, its tip pointed and deeply slit. The œsophagus, Pl. XXII, Fig. 3, *a b c d*, is three inches and a quarter in length, and is presently enlarged into a kind of crop inclined to the right side, and three quarters of an inch in width. The stomach, *d e*, is small, and moderately muscular, with a dense longitudinally rugous epithelium of a reddish colour. The intestine, *e f g h i*, is ten inches long, very wide; the cœca, *h*, two and a half twelfths long; the rectum very short and dilated into an oblong sac.

The bill is black, as is the interior of the mouth; the feet and claws are also black; the iris purplish-red. The general colour of the plumage is light greyish-brown, anteriorly approaching to brownish-orange, of which colour is the forehead, and posteriorly shaded into ash-grey, but with the lower tail-coverts brownish-orange. A band of black from the base of the upper mandible, includes the loral space, passes over the eye, and terminates on the occiput, where it is concealed by the crest. On the throat is a glossy black patch, about three quarters of an inch in length, margined on each side with a band of which

the anterior part is white, the posterior brownish-orange. The quills and larger coverts are dark grey, towards the end greyish-black, the primary coverts largely tipped with white; the primary quills with an elongated yellow spot at the end of their outer web; the secondary quills with a similar spot of white. The tail is grey at the base, black toward the end, with a terminal bar of pure yellow.

Length to end of tail 9 inches; to end of wings $8\frac{1}{2}$; extent of wings 16; wing from flexure $4\frac{9}{12}$; tail 3; bill along the ridge $\frac{6}{12}$, along the edge of lower mandible $\frac{8\frac{1}{2}}{12}$; tarsus $\frac{9}{12}$; first toe $\frac{4}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; second toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; third toe $\frac{7\frac{1}{2}}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{2\frac{1}{2}}{12}$.

Female.—The female is somewhat less, but otherwise similar to the male. The vermilion tips of the secondary quills are more slender, and less numerous.

Length to end of tail $8\frac{1}{4}$ inches; bill along the ridge $\frac{5}{12}$; wing from flexure $4\frac{8}{12}$; tail $2\frac{10}{12}$; tarsus $\frac{9}{12}$; hind toe and claw $\frac{8}{12}$; middle toe and claw $\frac{10\frac{1}{2}}{12}$.

Variations.—The principal variations have reference to the wax-like appendages to the secondary quills, of which the greatest number is seven.

Habits.—This bird, which I have not had the good fortune to see alive and at liberty, visits us accidentally, or at irregular periods, making its appearance generally in large flocks, and in winter, when it betakes itself to the hedges and rowan trees, to feed on their berries. It has been met with so frequently in Scotland as to render it unnecessary for me to present a list of places and times at which it has been seen, and yet at such irregular and often distant periods that it must be considered as a very rare bird even there. In England, if we except the northern counties, it is of still less frequent occurrence, although specimens have been obtained as far south as Devonshire and Cornwall. It is said to extend over the continent in winter, and to return in the end of spring to the arctic regions; but its breeding places are unknown. Its geographical range is vast, for it equally inhabits the north of Asia, is mentioned by M. Tem-

minck as occurring in Japan, and has been observed by Dr Richardson, Mr Macculloch, and others in North America, where it migrates in the same manner. With us it is generally shy, easily put to flight, and of active habits. It is said to feed not only on berries of the ivy, rowan, white-thorn, and wild roses, but also on insects, which it pursues in the same manner as Shrikes and Flycatchers. The Cedar Bird of America, which is a species of the same genus, is represented as feeding chiefly on berries, but as also seizing insects in the manner of Flycatchers, although not with equal dexterity. Both species are said to be much addicted to gluttony, and in a state of captivity to gorge themselves so excessively as sometimes to be suffocated. The habits of the American species have been pretty well described by Wilson and others, but those of the European are little known. The latter is usually named the Bohemian Chatterer, although a remarkably silent bird, and not more common in Bohemia than in many other parts of Germany. As the black patch on the throat is one of its principal distinctive characters, Black-throated is evidently a better specific name than Bohemian.

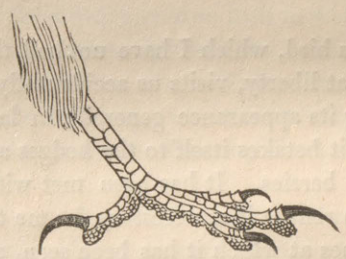


Fig. 261.

To Family IV. Laniinæ, p. 486.

Family III. Coraciinæ. Coraciine Birds.

~~PSARINÆ.~~

~~THICK-BILLS AND ALLIED SPECIES~~

Nearly allied to the Lanjinæ and Myiotherinæ on the one hand, and to the ~~Turdinæ~~ Alcedinine and ~~Thremmaphilinæ~~ Meropine on the other, is a family of birds, which includes the genera ~~Psaris, Graucalus~~, Irena, Eurystomus, Coracias, and several others, of which the general characters are as follows.

Bill stout, of moderate length, opening to beneath the middle of the eye, broad at the base, gradually compressed toward the end: upper mandible with the dorsal outline convex and declinate, the ridge indistinct, the sides convex, the edges thin, slightly arched, with a faint sinus close to the tip, which is slender and deflected; lower mandible with the angle short, the dorsal line slightly convex, the ridge obtuse, the sides convex, the edges slightly arched, the tip obliquely truncate.

Nostrils basal, rather large, partially concealed by the feathers. Eyes of moderate size, eyelids generally bare unless toward the edges. Aperture of ear roundish, of moderate size. Head large, roundish, or broadly ovate; neck short; body moderately full. Feet small; tarsus very short, rather stout, with seven broad anterior scutella; toes moderate, the second little longer than the first, the fourth considerably longer; claws moderately curved, much compressed, laterally grooved, acute.

Plumage moderately full, generally blended. Bristles at the base of the bill usually strong. Wings of moderate length, broad, of twenty-three quills, of which the third is longest, the first little shorter than the second; the primaries not much exceeding the secondaries. Tail of twelve feathers, of moderate length, generally even, but various.

These birds are all inhabitants of warm climates, and for the

most part gaudily coloured. Their habits are little known, but it appears that they generally feed on insects. One species ranks with us as a rare and accidental visitant.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. CORACIAS. ROLLER.

Bill nearly as long as the head, rather wide at the base, stout, compressed; the upper mandible with the dorsal line slightly arched and declinate, the edges nearly straight, with a very slight sinus, the tip small, slender, declinate; feet very short; tarsus with seven very broad scutella; toes free; second considerably longer than the first, and much shorter than the fourth; claws moderate, arched, much compressed, laterally grooved, acute; strong decurved bristles at the base of the upper mandible; wings of moderate length, very broad, rather rounded; tail generally even; of twelve broad feathers.

1. *Coracias garrula. Garrulous Roller.* Head, neck, and lower parts pale bluish-green, back reddish-brown.

Genus I. CORACIAS. Linn. ROLLER.

The Rollers are birds generally of the size of a Jay, and somewhat resembling that species in form, but with much shorter feet, and remarkable for the bright colours with which their plumage is adorned. They seem to be connected with the ~~Thremmaphilinæ~~ Graculinæ by the genus Gracula, and with the Alcedinæ by Merops, which they resemble in colouring; ~~but their general form seems to me to indicate a greater affinity to the Laniinæ and Myiotherinæ than to the families just mentioned.~~

Their body is rather full; the neck short; the head large and roundish. The bill nearly as long as the head, opening to beneath the eyes, rather wide at the base, but presently compressed, and higher than broad; upper mandible with the dorsal outline slightly arched and declinate, the sides rapidly sloping and convex, the ridge obtuse, the edges acute, with a slight sinus close to the small, deflected, rather acute tip; lower mandible with the angle moderate, the dorsal line nearly straight, the tip narrow, and obliquely truncate. Nostrils basal, lateral, oblique, linear, rather long, partially concealed by the feathers, which are not directed forwards. Eyes of moderate size, with a bare triangular space behind. Feet very short; tarsus with seven very broad scutella; hind toe rather small, second shorter than the third, anterior toes free. Claws of moderate length, arched, much compressed, slender, acute.

Plumage rather full, blended. Several strong decurved bristles on each side of the mouth. Wings of moderate length, very broad; the second and third quills longest; the primaries not much exceeding the secondaries when the wing is closed. Tail rather long, generally even, of twelve broad feathers.

The Rollers are peculiar to the old continent and its islands, species occurring in the warmer parts of Asia, and in Africa, and one of them extending into Europe.

Linn.

1. CORACIAS GARRULA. THE GARRULOUS ROLLER.

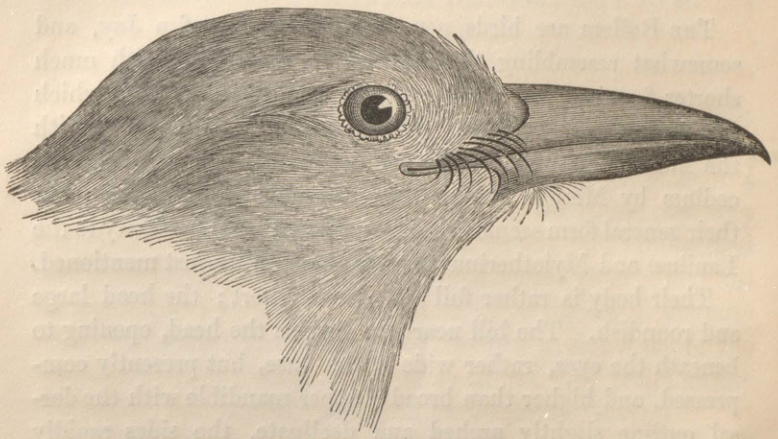


Fig. 262.

Coracias Garrula. Linn. Syst. Nat. I. 159.
Coracias Garrula. Lath. Ind. Orn. I. 168.
Roller. Mont. Orn. Dict.
Rollier vulgaire. Coracias garrula. Temm. Man. d'Orn. I. 127.
Garrulous Roller. Coracias garrula. Selb. Illustr. I. 117.
Coracias garrula. Garrulous Roller. Jen. Brit. Vert. An. 156.

Head, neck, and lower parts light bluish-green; back and scapulars light brown; smaller wing-coverts bright blue; quills light greenish-blue at the base, deep bluish-black in the rest of their extent; tail greenish-blue, the outer feathers tipped with black.

Male.—The Garrulous Roller, which is about the size of the Blue-winged Jay, is moderately stout, and of rather elegant proportions, but with the head large, and the feet very short. The bill is rather long, stout, much higher than broad, being considerably compressed, with the tip of the upper mandible slender and deflected, and that of the lower narrow and oblique-

ly truncate. The tarsus is shorter than the middle toe, rather stout, with seven very broad scutella, and reticulated behind; the hind toe with six, the second with nine, the third with twelve, the fourth with twelve scutella, the anterior toes free to the base, the fourth considerably longer than the second. The claws are of moderate length, much compressed, laterally grooved, and acute. The nostrils linear, oblique, four-twelfths of an inch long; the eyes of moderate size; the aperture of the ear roundish, a quarter of an inch in diameter.

The plumage is soft and blended; the feathers generally ovate, but on the head, fore-neck, and part of the breast oblongo-lanceolate. The wings are of moderate length, very broad, the secondary quills being of great length; the first quill half an inch shorter than the second, which is scarcely exceeded by the third; the outer secondaries obliquely emarginate. The tail is even, but with the outer feather on each side about a quarter of an inch longer.

The bill is brownish-black, darker toward the end; the iris reddish-brown; the feet light brown, the claws brownish-black. The head, neck, breast, and lower parts generally, are of a light bluish-green, approaching to verditer; the neck and breast with paler streaks; the back, scapulars, and inner secondaries, yellowish-brown; the anterior smaller wing-coverts and rump azure blue, the latter of a deeper tint; the other wing-coverts light greenish-blue. The quills are verditer blue at the base, deep bluish-black in the rest of their extent; the tail-feathers are greenish-blue, the two middle much darker, the outer tipped with black.

Length to end of tail 13 inches; bill along the ridge $1\frac{4}{12}$, along the edge of lower mandible $1\frac{8}{12}$; wing from flexure $7\frac{7}{12}$; tail 5; tarsus 1; hind toe $\frac{6}{12}$, its claw $\frac{4}{12}$; second toe $\frac{7\frac{1}{2}}{12}$, its claw $\frac{4}{12}$; third toe 1, its claw $\frac{5\frac{1}{2}}{12}$; fourth toe $\frac{1}{1}\frac{1}{2}$, its claw $\frac{4\frac{1}{2}}{12}$.

Female.—The female resembles the male.

Habits.—The Roller is said to occur in Africa, various regions of Asia, the European countries bordering on the Mediterranean, the southern provinces of Russia, some parts of

France and Germany, and even Denmark and Sweden. In Britain, although its visits are rare and at uncertain periods, it has been killed in Orkney on the one hand, in Cornwall on the other, and in various intermediate places, chiefly along the eastern coast. In 1835, an individual shot in the neighbourhood of Inverness was sent to Mr Carfrae in Edinburgh, to be prepared. A specimen, now in decay, which has long been in the Museum of the University of Edinburgh, is said to have been shot at Dunkeld. Mr Selby mentions one that was found dead in Northumberland, and at least two more have been obtained in the same district. Several have also been procured in Yorkshire, Norfolk, and Suffolk. The Roller however, while it is one of the most beautiful, is also one of the rarest of our land birds; and, as opportunities of observing its actions so seldom occur, they have not been described by any of our ornithologists.

Of a shy and restless disposition, it prefers the forests and solitary places, but sometimes associates with rooks and other birds, searching the meadows and ploughed fields for food. It lives chiefly on insects, but also eats slugs, worms, reptiles, and soft fruits. Its flight is rapid, and it has been seen to descend at times like the rook or tumbler-pigeon. Its voice is said to be loud and harsh. It nestles in the hollows of trees, or, when these are wanting, in holes which it digs in the banks of rivers. The eggs are broadly elliptical, nearly an inch and a half in length, smooth and of a glossy white. They are thus similar to those of the Kingsfisher and Bee-eater, and this circumstance, together with the similarity in the mode of nestling of these birds, indicates an affinity of structure.

Young.—According to Mr Yarrell, "young birds do not attain to brilliant colours till their second year, previous to which they are dull brown above, and greyish-green underneath."

Family IV. Oriolina. p. 71, vol. II.

PRACTICAL ORNITHOLOGY.

NINTH LESSON.

SCENE FROM THE FIFESHIRE COAST IN MARCH. VELVET DUCKS, CORMORANTS, LARKS, LAPWINGS, SHELLS, AND A SEA-DEVIL. VARIOUS OBSERVATIONS. MODES OF PREPARING SKELETONS AND DIGESTIVE ORGANS OF BIRDS. A STEAM-BOAT IN A STORM. RECOLLECTIONS OF THE HEBRIDES.

Few landscapes in Britain combine more of the elements of natural and artificial beauty and grandeur than that which now presents itself to our view. From this craggy eminence on the Fifeshire coast, one sweep of the eye discovers the wide entrance of the Frith of Forth, with the Bass and North Berwick Law, two mounds of plutonic rock that have emerged from the primal abyss, the gently rising grounds of East Lothian, blending into the dim ridge of the Lammermuir, which runs into the Peebles-shire hills, the Pentlands clad in their wintry garb of pure white, the nearer prominences of Salisbury Craigs and Arthur's Seat, the beautiful expanse of waters, with its islands and undulated shores. Right opposite is the capital of old Scotland. How beautifully, ridge beyond ridge, rises the noble city, from the sea-shore to the crowning heights of the Calton Hill, the High Street, and the Castle Rock!

As a Scot, I feel proud of thee, Edina, thou queen of cities! See how the elements conspire to adorn the picture: the strong blasts of the east wind have ruffled the bosom of the Frith; a fleet of small vessels has taken shelter in the lee of Inchkeith; a huge grey hail-cloud pours down its long winding streams on the valley of Dalkeith; and the smoke of the city spreads to the westward, like a dense autumnal mist. Let the Englishman, on Shooter's Hill, gaze with wonder and delight on the vast mass of brick that constitutes the metropolis of his native land, and of the commercial world, the long-extended forest of masts that springs from the silver Thames, the smooth landscape, and the

murky sky of the London basin ;—for my part, I am content to gaze upon those cold but glorious hills, and shiver in the keen blast that rolls the ragged clouds toward the Grampians.

The Velvet Ducks, yesterday so numerous in the Bay of Kirkaldy, have sought refuge farther up the estuary ; but the Cormorants are still seen reposing on the rocks off Seafield Tower, where all the year round you may find them at low water, often in large flocks, standing lazily on the blackened crags, now and then spreading their large broad wings to the breeze, as if to dry them.

Well, there being such a surf on the shore, I suppose a boat cannot land at Pettycur, and therefore we must walk to Burntisland.

It is just so ; but a naturalist needs never be at a loss for amusement. Go where you will, there are birds. These larks, which a few days ago were in full song, are now almost mute ; but, although crowded in the shelter of the stone fences, and on the western slopes of the little hills, they diligently search the ploughed fields. Here, over the wall, we may view them at hand. Now and then a male erects himself, and emits a pleasant *churr*, which is responded to by a female, for I think they have paired, although it is only the beginning of March. One has encountered a rival, and they flutter in the air ; but the blast drives them to the ground, and seems to have cooled their ire.

A few Thrushes are seen gliding along the hedges, and a Blackbird hies away to the farm-yard. There a flock of Lapwings ! How beautifully they glide and wind, now inclining to one side, now to the other, now shooting away, now labouring against the gale. Some birds are speeding swiftly with quick equal beats of their curved and pointed wings. They are Golden Plovers, proceeding toward the shore, the high grounds being covered with snow, and the marshes frozen. Here are some Pipits cowering among the sea-weeds, and chirping at intervals their feeble and monotonous cries. Behind the breakers is a Northern Diver, who gallantly floats on the surges. He has a fish in his bill, apparently a flounder, which he cannot swallow , wide as his gullet is, and is dabbing at it

and shaking it, probably endeavouring to tear it to pieces. Here too is a pair of lovely Long-tailed Ducks, Harelda glacialis.

The sands are strewed with razor-shells and algæ :—Venus pullastra, Venus gallina, Venus exoleta, Cyprina islandica, Buccinum undatum—but our business is not at present to gather shells. Let us see what these crows are eating.

It is a large Sea-Devil, or Frog-fish, Lophius piscatorius. On the links are scattered many Gulls: the Great Black-backed, the Herring Gull, Larus canus, and Larus ridibundus, together with a great number of Rooks and some Daws. Three weeks ago, when about the middle of the Frith, I saw two of these birds crossing from Newhaven to Pettycur, with a strong westerly side-wind, and it was curious to observe that they advanced sidewise, keeping their heads to the wind, when it blew fresh, and shooting along in the quieter intervals, sometimes gliding rapidly as if they had met with a clear space, and again making little progress, as if it required nearly all their efforts to maintain their place. Gulls, although unsteady fliers, shoot along in their desultory manner with much more ease; but the smaller waders beat all in their flight, no gale appearing to impede their progress.

See that thin dusky streak far away over the water! Now it expands and curves. It is singular enough, if it be vapour.

It is a flock, and a large one too, of Sandpipers, probably Tringa Cinclus, crossing the Frith. The Thrushes have been busy with these snails with which the stone-wall is crusted; but at present not a single small bird is to be seen on these bare pastures. If we visit the stack-yard on the hill-side, we shall probably meet with many.

Some of the ricks have been sadly plundered: the straws are lying about, and the husks emptied.

These depredations have been committed by the Rooks. You see them covering that solitary stack at a distance. The Corn Bunting has been accused of pulling out the straws deliberately to get at the seeds, but I have never seen it do so, even in the Hebrides, where it is very abundant, and the straws being short and slender, more easily removed. In truth,

I do not believe it has strength enough to pull out a wheat stalk with the spike attached.

Here are a few of these Buntings, more of the Yellow species however, Brown Linnets, Green Finches, two or three dozen of Larks, and a flock of Sparrows. How merrily the little Wren glides along the side of the stack, peeping into the cavities, while the disconsolate-looking Hedge Chanter creeps along the ground. Well, after all, birds must commit considerable havock at times, and it would be difficult to determine in how far they counterbalance it by destroying grubs and insects.

They do indeed. I have seen on the north-west coast the fourth part of a crop of barley, in a remote situation, destroyed by the Grey Geese, which came in flocks at night to feed upon it. So wary were they too, that although a friend of mine went out almost every night, he never succeeded in getting a shot.

We are fortunate after all: here in the harbour is the Steamer, although the passage will be desperately rough. Some Pied Wagtails are gleaning by the edge of the water. Let us adjourn to the inn, refresh ourselves, and talk of national affairs, the Intrusionists, the Chinese war, Socialists, Phrenology, and the Canadians. By the way, I never yet saw more than one American, who did not seem or affect to have, occasionally at least, a mortal hatred to England, nor one, who while he professed to be democratic, did not fail to boast of his aristocratic friends. Measuring national greatness by the acre, some of them talk of England as contemptible. One of them whom I met on Loch Lomond two autumns ago called our mountains mole-hills, our lakes pools, and our trees shrubs. Probably with him our men are Lilliputians, our cities villages, our eagles sparrow-hawks, and our salmon small fry. These people forget that the best of them are merely Britons, domiciled over the waters. May they prosper; but Old Scotia, thou little bit of barren rock and peat-bog, thine be honour and renown.

As we have half an hour to wait, let us rather talk about birds:—the art of making skeletons for example, or of preparing the digestive organs.

With all my heart. But remember, that can be taught to advantage only by some practice. However, I may now state the process. First then, how to make a skeleton. Take a bird, skin it, remove the greater part of the flesh with a scalpel or penknife, take out the thoracic and abdominal viscera, and put it into a jar of water. The water will remove the blood from the bones, should there be any in them. Next day begin at the head, and remove by cutting with a scalpel the flesh and periosteum, commencing at the base of the bill, and ending at the neck. This must be done neatly and carefully, so as not to scrape the bones, nor leave upon them the least mark of the knife. I have seen skeletons prepared by an excellent anatomist, of which most of the bones were scraped, then smoothed with sandpaper, and ultimately polished; but, although they looked pretty, they had lost their natural character. Well, when you have worked an hour or two, put the skeleton again into clean water. Next day, clear the neck; and so on, going over the spine, the anterior, and the posterior extremities, and lastly the ribs. By this time, or sooner, the horny covering of the jaws or mandibles, and the claws, will readily come off on being pulled. All the ligaments by which one bone is connected with another having been left, the bones still remain attached to each other. You now cut across the ligament by which the occiput is connected with the cervical vertebræ; take a small slender-pointed syringe, and squirt water into the cavity of the skull, through the foramen magnum, until the brain and its membranes are removed. Then bore a small hole in each end of the long bones, and inject a solution of soda in water into their cavity, so as to clear away the blood and grease. After this, put the skeleton into clean water, in which a little muriate of soda has been dissolved, and let it remain there for a night, or a week, until it is quite clear of blood. In order to whiten it, you may put a very little solution of chloride of lime into water, and leave the skeleton in it for a night; then remove it into clean water, and let it remain there for twenty-four hours. Now, lay it out to dry for some hours, fasten its feet upon a board or perch by means of pins, or small wires, or thread, place it in the attitude you judge

best, fix it so by means of a frame of brass wires, such as can easily be invented for the occasion, fastening its parts to the wires with threads or finer wires, and let it so remain some days until perfectly dry. Then apply with a camel-hair pencil a coat of mastic varnish to the ligaments, to prevent the subsequent effects of moisture, or the attacks of insects.

Small skeletons, up to the size of a Crow or Grouse, may be prepared in this manner. Those of large birds require to be supported by having the bones of the leg bored and wires run up through them, and a stout wire run into the spine, along the cavity for the spinal marrow. Or the supporting wires may run externally of the bones, in various ways, which will readily suggest themselves.

The bones of some birds, as Geese, Ducks, and Divers, especially those of the inferior extremities, are liable to be very greasy. Some soda in the water in which they are placed for a night or so, will assist in removing the oily matter by means of a brush.

Several skeletons may be cleaned at the same time, an hour or so being taken to each daily. Patience, neat-handedness, and some ingenuity, are all that are requisite in making skeletons of birds.

Skulls may be prepared in the same way. Or they may be macerated in water until all the flesh is putrid, when it may be washed clean away with water from a syringe. But in this case, some of the bones are apt to separate, and must be restored to their places by isinglass or gum.

Very beautiful preparations of the digestive organs may be made in various ways. You have a bird, of which the organs have not been damaged by shot. Fill a basin or other convenient vessel with hot water, and place the bird in it. Renew the water, if necessary, until all the parts of the bird have acquired a high temperature. In the meantime have your injecting apparatus ready, and a pot of white bees' wax, mixed with a little turpentine, on the fire. Fix the pipe of the syringe into the top of the gullet, and tie the extremity of the rectum. Inject the intestinal canal. Let the bird remain until cool, or pour cold water upon it. Then remove all the parts, dissect

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the organs clean, lay them out, arranged in their natural position. When perfectly dry, wash them with oil of turpentine, and afterwards give them two coats of copal varnish.

Or the digestive organs may be taken out, carefully dissected and put into water for a night, or longer, to remove the blood. Tie the rectum, and inflate them with a blowpipe introduced into the œsophagus. Hang them up, or lay them out, to dry, supporting the parts in their natural position by propping them up with wool, or hair, or some other contrivance. When dry, varnish, and suspend in a glass jar, of which the top is to be secured with a bladder.

Or these organs, as well as any others, may be preserved, after being carefully dissected and well cleaned, in clear whisky of ordinary strength, being suspended in a jar, which is secured by a layer of bladder, a layer of tin or sheet lead, and an outer layer of bladder, tied down, until dry, when the top is to be painted and varnished.

I have made some beautiful preparations in all these ways. Among the best that I have is the entire intestinal canal of a Sea-Eagle, and a Gannet, inflated and dried. A fine preparation of the entire intestinal canal of a Golden Eagle, filled with white wax, I gave to Professor Jameson. To the use of all my preparations any one is welcome; and him who may excel me in making them, or in observing and describing birds, I will try to admire, without envying; although, to tell the plain truth, I should really like to be first in these matters.

Let every one have his turn. Mine comes next. But I hear the steam whizzing. Let us be off. We shall have a rough ride over the Frith.——

Good pupil, be not so dejected; arouse thee; let us look on deck, and see the waves wash over it. What a lovely sight!

Come, come, this is too serious I tell you. I never was before in such a sea. Yet those billows are awfully beautiful, and the thick snow drives so furiously that I am sure the pilot cannot see five yards ahead. I hope we shall not come foul of the guard-ship. Let us down again to our den, and be thankful that we are not in an open boat, or, like Arion, astride on that porpoise.

No, no: these ordinary matters are good enough for ordinary minds. A high-souled critic informs us that we must not mingle the sublimities of nature with common occurrences. Let the people below amuse themselves as they best can. There, a gull swept over the vessel, like a meteor; and I almost fancied that a guillemot peeped over the gunwale, as if he expected to find a shoal of herrings afloat on the deck. I wish we had a cockney ornithologist here. These magnificent waves remind me of a more awful scene. Some people came from an island one night in winter to take me to see a patient. We set out as night fell, having six miles to row in darkness, over the deep black sea, amid enormous waves that rolled in smoothly and silently from the Atlantic, there having been a storm a few days before. It was a dead calm. A long loud clear howl came over the waters. The rowers rested and each blessed himself and his friends, as the Celts do when in danger or dread. Was it a drowning man? Some said it might be the Great Northern Diver. We lost our way, and could not see the land; when suddenly an enormous mass of water rose up behind us, broke into white foam, and rushed roaring along a reef of rocks half a mile in length, over which we had barely passed. Wave after wave rolled over the barrier, until it presented an appearance such as might well frighten a poor ornithologist. The boatmen gazed into the dark night, shuddered when they reflected that they had escaped destruction only by two minutes, then pulled their oars with vigour, and soon gained the land.

* Others have the bill of moderate size, though the gape is still wide, and the wings, though generally long, not narrow. The nostrils are small, but the eyes of moderate size or large, as are the apertures of the ears. The tongue is small and triangular; the oesophagus wide, without crop; the stomach large and thin; the intestine of moderate length and width; coeca none in the diurnal, large and oblong in the nocturnal species. — The feet are generally very 551 small. The toes, four, but variously disposed; the claws curved, and acute.

Intent during the periods of repose, they are mostly on wing, in pursuit of insects, which they seize in open flight. Some of them, however, alight to pick up larvæ or worms, as well as sometimes insects, and even berries. ~~Their feeding habits are somewhat modified, as their intestinal canal has no peculiar muscles.~~ None of them, however, walk with ease, or advance to any distance on the ground, and some of them are totally incapable of walking.

IÆ. Volitatorial Birds.

ORDER ~~XI.~~ II. VOLITATORES. ~~GLIDERS.~~

The birds of this order may be distinguished by characters indicative of that peculiar adaptation to rapid, light, and long-sustained flight, which has suggested to me the name Volitatores. (Æ.) Feeding almost exclusively on insects, which they seize in the open air, ~~they~~ many of them have a form, which, although moderately muscular, is rendered buoyant by their extremely elongated though very narrow wings. Their head is broad and depressed; the bill very short in proportion to its breadth, the mouth of extreme width, and copiously supplied with a viscid mucus, which enables them more easily to retain the insects on which they feed. They have a peculiarly light and bounding flight, glide along with astonishing speed, deviate on occasion as if without effort, and seem to be scarcely liable to fatigue in their * > aërial wanderings, which are therefore extremely protracted. ~~On the other hand, some of them are totally incapable of walking, and none ever advance to any distance on the ground.~~ Four ~~Three~~ distinct groups enter into this order, ~~which is the same as that named Chelidones by M. Temminck:~~ The Trogonina, Cypselina, Cuculina, and Caprimulgina. All the species of the first of these families are extra-European and the other three are very imperfectly represented with us, it being only in warm climates that they exhibit their full development.

The *Hirundinæ*, or Swallows, are characterized by their very short, somewhat triangular bill; extremely long and narrow wings; emarginate or forked tail; and very small feet, of the ordinary form, the first toe being directed backwards, and the third considerably longer than the other anterior toes, and also exceeding the tarsus. Their digestive organs do not differ ma-

terially from those of the Excursores and Cantatores; and their trachea is furnished with inferior laryngeal muscles, which gives them the power of uttering modulated sounds.

The *Cypselinæ*, or Swifts, differ little in external appearance from the Swallows; but have the toes all directed forwards, and the third toe exceeding the lateral less than in any other group. Their wings are extremely long and narrow; their tail even or emarginate. Their digestive organs differ, inasmuch as the cœca, which are very small in the Swallows, are in them entirely wanting. The inferior larynx is destitute of muscles, as in the next group.

The *Caprimulginæ*, or Goatsuckers, have the mouth excessively wide, but the horny part of the bill generally very small; the eyes and ears very large; the feet feeble, like those of the Swallows; the wings very long, but broad, and the tail elongated. The gullet and stomach are very wide and thin, and the intestines are furnished with large oblong cœca, like those of the Owls, to which they are also allied in the texture of their plumage, and their nocturnal habits.

Fig. 263 represents the wing of a Swallow; Fig. 264 that of a Swift; and 265 that of a Goatsucker.



Fig. 263.

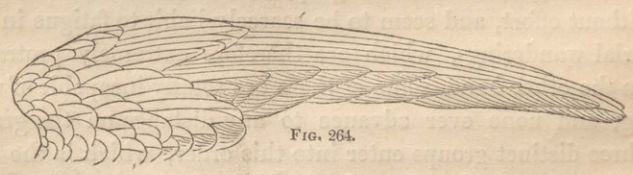


Fig. 264.



Fig. 265.

Family I. HIRUNDINÆ. *Hirundinine Birds.*

SWALLOWS AND ALLIED SPECIES.

p. 552.

The Cypselinæ, or Swifts, are readily distinguishable by their extremely short and feeble bill, opening beneath the hind part of the large eyes, the copious secretion of clammy mucus furnished by the large salivary glands, the extremely short and rather wide intestine, entirely destitute of cœca, the trachea without inferior laryngeal muscles, the extremely short feet, of which the four toes are directed forwards, and the claws rather large, decurved and very acute, the wings extremely long and falciform, and the tail of ten feathers. They feed exclusively on insects caught on wing, and reside in holes or crevices in buildings or rocks.

The Cuculinæ, or cuckoos, have the bill much larger and stronger

the secondaries being very short and few; the tail of twelve feathers. The mouth is very wide; the stomach elliptical, muscular; the cœca very small. They nestle in holes, or against the face of rocks, buildings or trees, in which case they construct a nest of mud, or of twigs held together by a glutinous substance. The eggs are generally four or five, white, either plain or spotted. All the species which breed in the cold and temperate regions retire within the tropics in winter, their exclusively insectivorous regimen rendering it impossible for them to subsist when the cold is severe. Their extreme activity, the elegance of their flight, and the attachment which they shew to human habitations, render them universal favourites. In the structure of their digestive organs, as well as in their habits, they are nearly allied to the ~~Myiotherinæ~~ *Muscicapinæ*, which are equally migratory, ~~and dissimilar~~

iæ. Volitatorial Birds.

terially from those of the Excursores and Cantatores; and their trachea is furnished with inferior laryngeal muscles, which gives them the power of uttering modulated sounds.

The *Cypselinæ*, or Swifts, ~~differ little in external appearance from the Swallows~~; but have the toes all directed forwards, and the third toe exceeding the lateral less than in any other group. Their wings are extremely long and narrow; their tail even or emarginate. Their digestive organs differ, inas-

than in the Cypselinæ or Caprimulgina, wide at the base, compressed towards the end, somewhat arched and pointed; the oesophagus wide, the stomach very large, and thin; the intestine of moderate length and width, with large oblong coca; the trachea with a single pair of inferior laryngeal muscles; the tarsi short or moderate, with a few very large anterior scutella; the toes broad beneath, the fourth or outer reversed, so as with the first to be capable of opposing the second and third, which are united at the base; the claws curved, acute; the wings long or moderate, much rounded; the tail ample, graduated or rounded. They feed on insects and larvæ, and frequent wooded places.

The Caprimulgina.



FIG. 263.

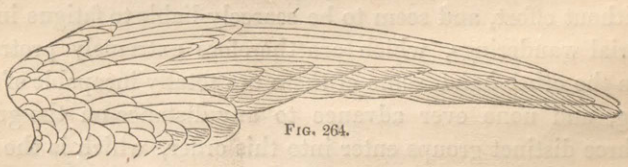


FIG. 264.



FIG. 265.

To p. 606.

Family I. HIRUNDINÆ. Hirundinine Birds.

SWALLOWS AND ALLIED SPECIES.

The birds of which this family is composed have by several recent authors been grouped into genera distinguishable by slight differences in their organization, and more especially by the greater or less emargination of the tail. Some of these genera are perhaps founded on sufficient grounds; but our three British species differ too little to sanction any subdivision of the single genus, Hirundo, to which they have usually been referred. As the characters of that genus will be given at considerable length, it is unnecessary here to state more than is absolutely essential. The Hirundinæ have the bill short, much depressed, broad at the base, compressed at the tip; the head broad and depressed; the neck very short; the body moderate; the feet very small, the claws compressed, curved, acute. The plumage glossy and blended; the wings very long and narrow, the secondaries being very short and few; the tail of twelve feathers. The mouth is very wide; the stomach elliptical, muscular; the cœca very small. They nestle in holes, or against the face of rocks, buildings or trees, in which case they construct a nest of mud, or of twigs held together by a glutinous substance. The eggs are generally four or five, white, either plain or spotted. All the species which breed in the cold and temperate regions retire within the tropics in winter, their exclusively insectivorous regimen rendering it impossible for them to subsist when the cold is severe. Their extreme activity, the elegance of their flight, and the attachment which they shew to human habitations, render them universal favourites. In the structure of their digestive organs, as well as in their habits, they are nearly allied to the Myiotherinæ, which are equally migratory,

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. HIRUNDO. SWALLOW.

Bill very short, triangular, opening to beneath the fore part of the eye, the gape-line straight, with a slight notch; nostrils small, linear-oblong; wings extremely long and pointed; tail of twelve feathers, ~~emarginate or~~ forked; tarsus extremely short, bare ~~or feathered~~; the first toe directed backwards, the third much longer than the rest; claws rather long, arched, acute.

1. *Hirundo rustica.* ~~*Red-fronted*~~ *Swallow.* ~~Tail very deeply forked;~~ Upper parts glossy blue; forehead and throat red; tail with white spots.

2. ~~*Hirundo rubica. White-rumped Swallow.* Tail deeply forked; tarsi and toes feathered;~~ rump white.

3. ~~*Hirundo riparia. Bank Swallow.* Tail slightly forked; upper parts greyish-brown.~~

Genus II. Chelidon. Martin.

Bill very short, triangular, depressed, opening beneath the fore part of the eye, the gape-line straight, with a slight notch; nostrils very small, elliptical; wings extremely long and pointed; tail of twelve feathers, forked; tarsus extremely short, bare thinly feathered all round, but having six anterior scutella; toes also thinly feathered; claws arched, acute.

1. Chelidon urbica. House Martin. Head, hind-neck, and fore part of the back glossy steel blue; rump and lower parts white.

Genus III. Cotyle. Sand-Martin.

Bill extremely short, depressed, its outlines convex; nostrils very small, elliptical; wings extremely long and pointed; tail of moderate length, slightly forked or emarginate; tarsus very short, bare anteriorly, with six or seven scutella; claws rather long, moderately arched, very acute.

1. Cotyle riparia. Sand-Martin. Upper parts and a broad band across the breast greyish-brown; lower parts white.

Genus III. Progne.

Linn.

Genus I. HIRUNDO. SWALLOW.

Bill very short, much depressed, very broad at the base, narrowed to the point, so as to present a triangular form when viewed from above: upper mandible with its dorsal outline slightly convexo-declinate, the ridge obliterated, the sides sloping at the base, sloping but convex toward the end, the edges slightly inflected, the tip slender but rather blunt, the notch distinct; lower mandible with the angle very large and wide, the dorsal outline ascending and nearly straight, the sides sloping outwards but convex, the edges a little involute, the tip narrow but rather obtuse; gape-line commencing beneath the anterior angle of the eye, nearly straight.

Mouth very wide; the upper mandible slightly concave, with a slender prominent central line, the lower also shallow, with a similar line; the palate flat, but slightly arched, with two faint lateral lines; the posterior aperture of the nares linear, papillate behind, and having its lateral spaces also covered with small papillæ. Tongue short, sagittate, emarginate and papillate at the base, two of the papillæ much larger, flat above, its tip bifid. The œsophagus is wide at its commencement, gradually contracts, and preserves a nearly uniform diameter; the proventriculus being but slightly enlarged. The stomach is a broadly elliptical, moderately compressed gizzard, of which the lateral muscles are of moderate thickness, the cuticular lining thin and broadly rugous. The intestine is short, and rather wide; the cœca very small. ~~The œsophagus is rather narrow; the lateral muscles of the stomach of considerable strength, the lower muscle not distinct from the right lateral.~~ Pl. XXII, Fig. 4.

; the proventriculum very wide

The nostrils are small, linear-oblong, in the fore part of the large nasal membrane, which is bare anteriorly and along the outer edge. The eyes are of moderate size; the eyelids bare,

with two marginal series of feathers, their bare edges crenate. External aperture of the ear rather large and elliptical.

The general form is slender; the body short, ovate, rather compressed; the neck short; the head ovate, with the fore part flattened. The feet are extremely short and slender; the tarsus extremely short, bare ~~or feathered~~, ~~but~~ always with some distinct scutella below. The toes are ~~feathered, or~~ bare and precisely similar to those of the Sylviæ and other birds of that family, being of moderate length, slender, and much compressed; the first stouter, with two joints, the second with three, the third with four, the fourth with five, the second and fourth equal, the third much longer, and connected with the fourth at the base. Claws rather long, moderately arched, laterally grooved, tapering to a very acute point.

Plumage soft, blended, glossy on the upper parts, the feathers oblong, those on the fore part of the head short; the bristle-feathers at the base of the upper mandible very small. Wings extremely long and pointed; the quills and coverts with very strong elastic shafts; the quills eighteen; the secondaries rather short, incurved, broad, and deeply emarginate; the primaries tapering to a rounded point, the two outer longest, and a little incurvate towards the end. Tail varying in length ~~and form~~, of twelve feathers, ~~and even or~~ forked.

The Swallows form a ~~very~~ numerous genus of birds, ~~varying in size from that of a Willow Wren to that of a Song Thrush~~, and inhabiting both continents, but all residing in the tropical regions during the winter, and only some migrating towards the poles in summer. They live on insects, which they catch on wing, and therefore are furnished with the means of performing the most rapid and gliding flight. Their feet being small and feeble, they are scarcely able to walk on the ground, and seldom alight there, even to drink, but sip the water as they skim over its surface, and bathe by dipping into it while on wing. They fasten their nests to walls or rocks, or place them in holes and other concealed stations. They are often externally composed of solid materials, such as earth or sand agglutinated in pellets, and are lined with straws, feathers, and other soft substances. The eggs are generally four or five,

white, or having a light ground with reddish spots. They moult once in the year, and always in their winter quarters, so that they arrive in the colder regions in full plumage. "I am indebted," says M. Temminck, "to M. Natterer of Vienna for the very interesting observation that the Swallows and Swifts moult once a-year in February, therefore at the time of their residence in the warm climates of Africa and Asia: a fact which is fatal to the alleged winter torpidity or sleep of these birds. M. Natterer's observations were made on swallows kept in cages, of which a few lived eight and nine years in captivity." As to the torpidity of these birds in winter, their being found in holes, and under water, it is surely now time to give up so absurd a notion. It is strange but true that fancies of this sort, such as the breeding of geese from barnacle shells, remain for ages matters of popular belief, after the learned, with whom perhaps they originated, have given them up.

The Swallows differ considerably from each other in the size of the bill, the form of the tail, the clothing or nakedness of the feet, and other circumstances, insomuch that several sections might be instituted in the genus; but as only three species occur in Britain, it is unnecessary to separate them in this manner. As all our species are referred to the single genus *Hirundo*, so they all ought to receive a single generic name, *Swallow*. One of them has been named the Chimney Swallow, and another the Window Swallow or Martin; but these names are not very correct, for the former rarely builds in chimneys, and both nestle in windows, as well as in other places. I therefore prefer naming the one the Red-fronted, and the other the White-rumped.

7 HIRUNDO RUSTICA. THE ~~RED-FRONTED OR CHIMNEY~~ Common Chimney SWALLOW.

SWALLOW. ~~COMMON~~ SWALLOW. GOBHLAN-GAOITHE.



FIG. 266

Hirundo rustica. Linn. Syst. Nat. I. 343.
Hirundo rustica. Lath. Ind. Orn. II. 572.
Chimney or Common Swallow. Mont. Orn. Dict.
Hirondelle de Cheminée. Hirundo rustica. Temm. Man. d'Orn. I. 427.
Chimney Swallow. Hirundo rustica. Selb. Illustr. I. 120.
Hirundo rustica. Chimney Swallow. Jen. Brit. Vert. An. 157.

Upper parts glossy steel-blue; forehead and throat brownish-red; a broad band on the fore-neck dusky; tail very deeply forked, each feather, excepting the two middle, with a white spot on the inner web; breast and abdomen reddish-white.

Species of the same family that arrive as with these visits

MALE.—This beautiful, most lively, and familiarly known bird, which, with the other ~~swallows~~, we gladly hail as the harbinger of summer, is of a slender form, having the body small and somewhat compressed, the neck short, the head rather large; the bill short, depressed, very broad at the base, the tip of the upper mandible a little deflected, the notch distinct. The mouth is very wide, measuring half an inch across; both mandibles slightly concave; the palate flat and but slightly arched; the tongue short, triangular, three and a half twelfths long, emarginate and papillate at the base, the tip slightly bifid. The œsophagus, Plate XXII, Fig. 4, *a b c d*, which is two

inches and five-twelfths long, gradually contracts from five-twelfths to two-twelfths; the proventricular glandules are broad and about half a twelfth long. The stomach, *d e f*, is a gizzard of moderate power, oblong, seven-twelfths of an inch in length, its muscles somewhat distinct, the cuticular lining thin and rugous. The intestine, *e f g h*, is six and a half inches long, rather wide, the diameter of the duodenal portion three-twelfths, the smallest diameter two-twelfths. The cœca, *g*, oblong, two-twelfths long and three-fourths of an inch from the extremity. The rectum, *g h*, is wide from the commencement, and dilates into a pyriform sac half an inch in diameter.

The nostrils are linear, oblique, one-twelfth of an inch long; the aperture of the eyes a twelfth and a half; that of the ears two and a half. The feet are very short and slender; the tarsus extremely short, being shorter than the hind toe with its claw, bare, excepting for a short space above, and having anteriorly a single undivided scutellum, and an inferior one, behind sharp-edged; the toes resemble those of a Sylvia; the first stronger, with seven scutella, the second with eight, the third with ten, the fourth with ten; the claws ~~rather~~ long, moderately arched, very slender, much compressed, laterally grooved, tapering to an extremely fine point, that of the first toe rather shorter than that of the third.

The plumage is very soft, blended, highly glossed or splendent on the upper parts; the feathers oblong. The wings are extremely long; the quills eighteen, the primaries nine; the first longest, the second almost equal, the rest rapidly graduated; the primaries narrow and rounded; the secondaries rather short, curved inwards, deeply emarginate. The tail is very long and deeply forked, of twelve straight feathers, the lateral very narrow and much elongated, exceeding the middle by an inch and a half, or sometimes by more than three inches.

The bill is black, the mouth yellowish, the iris light brown, the feet and claws brownish-black. The forehead and throat are deep chestnut or brownish-red; all the upper plumage, except the quills and tail-feathers, splendent with steel-blue changing to purplish; the neck all round being of the same

colour. The rest of the lower parts reddish-white, or greyish-white with a yellowish-red blush, or when the plumage is quite fresh of a most beautiful pale red. The quills and tail are greenish-black; their outer webs glossed with greenish-blue; the tail-feathers have a large spot of white on the inner web, about a third from the end, excepting the two middle ones.

Length to tips of tail $8\frac{3}{4}$ inches; extent of wings 14; wing from flexure $4\frac{10}{12}$; tail, middle feathers $1\frac{10}{12}$, lateral $5\frac{1}{4}$; bill along the back $\frac{4}{12}$, along the edge of lower mandible $\frac{7}{12}$; tarsus $\frac{5}{12}$; first toe $\frac{4}{12}$, its claw $\frac{5}{12}$; second toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; third toe $\frac{6\frac{1}{2}}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; fourth toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$.

Female.—The female differs very little from the male. The tail is considerably shorter, the red of the forehead and throat lighter; the dark band across the neck narrower, and the lower parts less tinged with red.

Length to end of tail $7\frac{3}{4}$ inches; extent of wings 14; wing from flexure $4\frac{10}{12}$; longest tail-feathers $3\frac{3}{4}$.

Variations.—Adult males exhibit little variation, the lower parts being merely lighter or darker, and more or less tinged with red, and the lateral tail-feathers more or less elongated. The same may be said of the females.

Changes of Plumage.—This species arrives in complete plumage, and does not moult until after its departure. The tints fade considerably as the summer advances, but the changes are not remarkable. A fine specimen newly shot exhibits the most splendent tints of blue and purple on the upper parts, which become much fainter in less than an hour, the purple almost entirely disappearing.

Habits.—The elegance and celerity of the motions of Swallows exceed those of the flight of almost all birds, and cannot fail to be observed and admired even by those most habitually inattentive to the phenomena of nature. The present species occurs abundantly, during the summer months, in the vicinity

of towns, villages, and farm-buildings. Its food, like that of all the other species, consists of small insects, which it seizes almost exclusively on wing. Its mouth is bedewed with a profuse clammy secretion, to which the insects adhere as they are caught; and on shooting a swallow, you often find half a dozen or more in its mouth. This happens early in the season, when as yet it has not built its nest, as well as after its young have burst the shell, and indeed at all times during its residence with us; so that it seems in this manner to collect a number sufficient to make a morsel, and not to swallow each insect individually. It also probably collects insects thus for its young, as indeed do many other birds, such as the Robin, the Hedge Chanter, the Sylviinæ in general, and many of the Deglubitores; for although, when flying about in the immediate vicinity of their nests, Swallows seem to carry each insect as it is caught to their young, yet we often find them during the breeding season flying at the distance of miles from any place where there are nests, and in this case it is not reasonable to suppose that they would return with a single insect.

During flight, the tail is generally little expanded, but in executing sudden turns, especially those of ascent and descent, it is sometimes spread out to its full extent, so as to disclose the white spots. It seems to glide through the air with the most perfect ease, in continuous sweeps, without the undulatory motion which most small birds exhibit. In fine weather it generally flies high, but in rain or during cold easterly winds, when the insects keep low and in the shelter of trees and walls, it comes nearer the ground, and may often be seen skimming along the tops of the herbage. When busily engaged in chasing its prey, it seldom utters any note, although at times it emits a low chatter.

Many prognostics of the weather are derived from this and the other species; but most of them are erroneous, and some apparently fabricated by persons who have not studied their motions. Swallows fly low or high according to the flight of insects, which is influenced by the state of the atmosphere; but little judgment can be formed of the future by attending to their motions. Thus, they fly low when there is a smart

cold breeze, especially if it be accompanied with moisture ; but this circumstance is not an indication of the continuance of rain or cold. I have seen the Swallows flying very low, in the shelter of trees, during rainy and rather cold weather, and yet, on the following day, none could be seen, the weather being clear. I have also observed them flying high in warm weather, amidst the clouds that were pouring down rain, accompanied with thunder. Yet people usually say that when Swallows fly high, fine weather may be expected. Once, however, I had the pleasure of observing a very marked instance of an indication of a change of weather afforded by the flight of birds. It had been raining for several hours, when sudden gusts of wind swept the trees, and a very heavy shower began to fall. At this moment a flock of rooks, which had taken shelter in some large trees, rose and swept across the direction of the wind, and soon after several swallows were observed beating up against it. At first I thought that the violence of the blasts had disturbed the rooks ; but not judging such a cause sufficient to drive the swallows abroad, I supposed that these birds, pining at home all day with hunger and inaction, had become sensible of a change indicative to them of fair weather, and in their impatience had come out in the very midst of the heaviest but last fall of rain. I intimated to those near me that such was my opinion, and waited for the issue. In half an hour, we had a clear sky, with a steady westerly wind, and abundance of birds abroad at their avocations.

It is very pleasant to watch the Swallows flying with their young over some meadow sheltered by trees, among which multitudes of small insects are sporting. The young are easily distinguished from the old birds by the comparative shortness of their tail, and by a less decided mode of flight. You see them mingled together, and following with your eye an old bird, as it meanders through the air, you perceive that it has caught several insects in succession, when immediately it calls, by a rapid enunciation of soft cheeps, to the young, which presently comes up, and on wing receives the morsel from its mother, the two birds rising a little when they meet, and fluttering to poise themselves. They then separate, each to renew its pleasant

labours. In the meantime a continued cheeping is kept up in the flock, although each bird emits generally only a single note at a time, which is occasionally responded to by one or more of the rest. I have seen the young birds betake themselves to the upper twigs of a tree for the purpose of resting, and on many occasions have seen both young and old so perch for a while.

The flight of this species, when in pursuit of its prey, over a low meadow, or among trees, or by a hedge, is wavering and as if undecided, although the inflections are no doubt made on purpose. It seldom shoots directly forward to any distance, but winds and turns in all directions, sometimes ascends or descends abruptly, wheels in wide circles, or skims along with an undulatory motion. The flaps or strokes of the wings are performed in a soft and sedate manner, and in its ordinary flight the tail is but very slightly spread. The use of that organ however is apparent at every turn, for then it may be seen expanded or closed, bent to either side, or directed downwards or upwards.

The ~~Red-fronted~~ Common Swallow occasionally associates with the ~~White-rumped species~~ Common Window Martin and the Bank ~~Swallow~~ Martinet; at least, they may all be seen together pursuing their prey over the same field. In windy weather, they collect in the shelter of walls, hedges, trees, or thickets; and, in rain, fly under the trees. When there is thin rain, or drizzling mist, they generally fly low; but in fine clear weather, they may be seen sporting in the open air—not that they are merely amusing themselves in their aërial rambles, but that their flight, being so buoyant, graceful, and varied, suggests the idea of play rather than of labour. I have carefully watched this species as it flew past, often within a few yards of me, to discover whether it keeps its mouth open, and I am decidedly of opinion, that in flying, it invariably retains the mandibles in close apposition, until it comes up to an insect. Indeed, the notion of its flying with open mouth is preposterous, although several excellent ornithologists have entertained it; for were swallows to proceed in this manner, there being no special apparatus for closing their œsophagus, the extreme velocity with which they rush against the air, would necessarily force it into their stomach. If a partial or

slight opening of the mouth be contended for, I answer that it is not in the least necessary, for the bird on coming close to an insect can no doubt open its bill to receive it, and that, having closely watched Swallows, I have failed to see their open mouths, and cannot believe the statement, until a respectable witness assures me that he has satisfied himself as to its accuracy. The sight of a Swallow must be extremely acute, when it can perceive a minute insect in the midst of its rapid career, and when it may often be seen abruptly to deviate several feet or even yards in order to seize one.

This species, like the others, besides perching on a twig or branch with ease, is also frequently seen to settle on the roof of a house, a chimney, or a wall; and it can walk, although only in a hobbling manner, on the ground, where it sometimes alights as if to pick up insects which it has observed there. I have often seen Swallows so employed, when, on going up, I could perceive nothing.

Sometimes, over a pool, you may see a multitude of Swallows collected in a quiet evening. As the insects are abundant, they fly more leisurely, and sweep in smaller curves, than on ordinary occasions, so that their actions may be here more satisfactorily studied than when they are flying at large. Every now and then, you observe one flutter over the water, and pick up an insect from its surface. On such an occasion I have seen two settle on a heap of soft cow dung, and holding up their wings and tail, and raising their body as high as possible on their short legs, pick up the insects which had attracted their notice.

Often over a lake or river or canal, you see them picking up in their rapid and graceful flight, the insects that float on the surface, or that have been drowned. On such occasions, they frequently stop suddenly on coming up, spread out their tail, raise their wings, flutter for a moment, and dash off. But sometimes also they pick up the insect in full career, by skimming the water in a gentle curve. Whether they actually drink on wing I cannot affirm; the fact seems doubtful; at least I have seen Swallows drink in the ordinary manner. One, for example, alighted on the street, hobbled to the gutter, and there sipped until satisfied.

In fine weather after rain they are often seen flying over the fields, or gliding above the trees, frequently uttering a short series of lively notes, which have some claim to be entitled a song, although people usually call them a chatter. I thought it remarkable that during the annular eclipse of the sun in the summer of 1836, when the Rooks and Sparrows had gone to bed, thinking it was night, this Swallow continued flying about as usual. It commences its labours before sunrise, and continues abroad until dusk, apparently continuing its pursuit all day with little intermission.

Swallows frequently assail Sparrow Hawks, or at least hover around and endeavour to annoy them, as do many other small birds. They seem to have a special antipathy to young Cuckoos also. A correspondent in the Magazine of Natural History, Vol. IV, p. 146, relates the following curious instance of audacity in a bird of this species. "In the fine brilliant afternoon of the 17th of last May I was walking through a retired village lane, when a stoat issued from the hedge, and placed himself in the path a few yards before me. A Swallow (Hirundo rustica) which was winging its airy circles just by, immediately perceived the little intruder upon 'broad-eyed garish day,' and, what I should have conceived completely contrary to its nature, pounced upon him, and straightway forced him to retire to his hiding-place. In a minute afterwards, however, the stoat again appeared; when the bird, having taken another round in the air, again obliged him to retreat. This was repeated four several times; and to my eye, it appeared that once the stoat was actually assaulted by the swallow; but in this I am inclined to think I must have been mistaken. At length, however, tired of the gambols of the frolicksome bird, the little quadruped, which in all probability under other circumstances would have made a hearty meal of his audacious prey, disappeared in the hedge, and I saw no more of him."

This species arrives in the south of Scotland from the 20th of April to the 5th of May, seldom earlier or later about Edinburgh. In the Statistical Account of Paisley, it is stated that "between the 8th and 18th of April, the Hirundo riparia, rus-

tica, and urbica, make their appearance ; the first generally by the 9th, while the Cypselus Apus seldom arrives till the end of the month. By the beginning of October they take their departure." In the south of England it sometimes makes its appearance as early as the first week of April, but generally about the middle of that month. " It sometimes happens," says Montagu, " that after their arrival, a long easterly wind prevails, which so benumbs the insect tribe, that thousands die for want of food. We recollect as late as the 9th of May, the Swallows on a sudden disappeared from all the neighbouring villages around. The thermometer was at 42, and we were at a loss to conceive what was become of these birds, which a day or two before were seen in abundance. But by chance we discovered hundreds collected together in a valley close to the sea side, at a large pool which was well sheltered. Here they seem to have found some species of fly, though scarce sufficient to support life ; for many were so exhausted that after a short time on wing they were obliged to pitch on the sandy shore."

In a sheltered hollow at Colt Bridge, about a mile from Edinburgh, in cold seasons, the Swallows often remain a week or more after their arrival, when scarcely an individual is to be seen in any other place in the vicinity.

It is not until a considerable time after their arrival that they begin to construct their nests, which they generally place, not usually in chimneys, as is alleged, but under the eaves of outhouses, and on beams or rafters within them, when free admission is obtained, sometimes also in the corners of windows, and even on the face of rocks, in quarries, or on the sides of a well or the shaft of a deserted coal-pit. " Here and there," says White, " a bird may affect some odd, peculiar place; as we have known a swallow build down the shaft of an old well, through which chalk had been formerly drawn up for the purpose of manure ; but, in general, with us this hirundo breeds in chimneys, and loves to haunt those stacks where there is a constant fire, no doubt for the sake of warmth. Not that it can subsist in the immediate shaft where there is a fire : but prefers one adjoining to that of the kitchen, and disregards the perpetual smoke of that funnel, as I have often observed with some degree

It is the same with another, and more picturesque hollow, through which the river Don passes, below Seaton House, near Old Aberdeen, where the different species of this family of birds visit us, one often coming two or three weeks by the inclemency of the weather.

of wonder. Five or six, or more feet down the chimney, does this little bird begin to form her nest about the middle of May, which consists, like that of the house-martin, of a crust or shell composed of dirt or mud, mixed with short pieces of straw, to render it tough and permanent; with this difference, that, whereas the shell of the martin is nearly hemispheric, that of the swallow is open at the top, and like half a deep dish: this nest is lined with fine grasses, and feathers, which are often collected as they float in the air. Wonderful is the address which this adroit bird shows all day long, in ascending and descending with security through so narrow a pass. When hovering over the mouth of the funnel, the vibrations of her wings acting on the confined air occasion a rumbling like thunder." The materials of which the nest is composed, as well as its form, vary according to circumstances. Thus, in August 1834, I observed several nests of this species stuck beneath the eaves at the end of an outhouse on the farm-steading of Granton in Dumfriesshire. They varied considerably in form and size. Those in corners were of an irregular roundish shape, rectangular above, where they were fitted to the angle, convex in front, and having on one side at the top a semicircular aperture, of which the beam formed the upper part. They were externally composed of pellets of friable earth, which had been applied in the state of mud; within the outer layer, of a crust of cow and horse dung; and internally of a quantity of straw and feathers of domestic fowls. A nest found on a beam in a shed at Gorgie Tanworks near Edinburgh, had its external part formed of pellets of cow's hair and earthy matter, cohering pretty firmly, but not agglutinated, and disposed in the form of a shallow cup without the bottom, that part having been formed by the plank. Straws were rudely disposed within the crust, and the lining was composed of a great number of large feathers of ducks and domestic fowls. In general, the nest is open at top, when not fastened under a beam or in a corner. The eggs are four or five, and differ considerably in size and form. They are usually of an elongated oval, rather pointed, ten-twelfths long, seven-twelfths in breadth, white or reddish-white, marked all over with scattered dark red

dots and specks, which are more numerous at the large end, and sometimes form a broad circle there. They are generally hatched from the first to the fifteenth of June; and sometimes a second brood is raised. The largest specimen in my possession is ten and a half twelfths long, the smallest nine twelfths.

For the following excellent description of the habits of this bird, as observed in East Lothian, I am indebted to Mr Hepburn.

"One of the few ornithological facts noted by our rustics is the appearance of the Red-fronted Swallow, which usually arrives in the third week of April, at the village of Linton, where most of them remain for some weeks, till the increasing warmth peoples the air with their prey, and the calls of love prompt them to disperse. Some betake themselves to their old nests, while the rest look out for suitable places in which to rear their young. It is not until the middle of May that they appear about our farmery, where they immediately commence a survey of the stables, byres, cattle-sheds, and outhouses, clinging to the beams, rafters, or walls; a few hours, sometimes two or three days, being thus occupied. It appears to me that this species is not nearly so capricious as the White-rumped, which often abandons its newly commenced or even half-finished nest, but proceeds steadily with its work. In the intervals of labour, they may be seen perched on the roofs, chimney-tops, walls, railings, or even trees. In the pasture fields, where thousands of insects are disturbed by the cattle, how beautifully they skim along, at times seeming bent on launching far into the liquid void, but with an easy and graceful turn shooting back to the spot which they left a moment before. The males warble at intervals, and sometimes sailing on stiffened pinions utter a guttural and grating kind of note. Having allayed their hunger, they return to their nests, dancing gaily along. How amorously modulated are the notes of the male:—*whit*, *whit*, *wheet*, *wheet*, *klee-hu*, *klee-hu!* The female shoots ahead, her mate strives in vain to overtake her, their speed is redoubled, forward they dash with such rapidity that the eye follows them with difficulty, as they glance round the tall chimney of the steam-engine, the tree-tops, and the pillars of the cattle-sheds. The chase is o'er, the feast and song are ended; they now di-

Mr. Durham Weir gave to Mr. Audubon the following statement respecting the various stations in which he had observed it breeding in Scotland:-

"About five or six feet down the inside of a wide circular chimney at Bowie Distillery, about five miles from Stirling, for some time past, three or four pairs of Swallows have annually built their nests. Upon the inside of the roof of the coolers at the same place, which is 250 feet long by 50 in breadth, upwards of a hundred pairs of them have for many years erected their habitations and reared their offspring. In the cooler at Glenmavis Distillery, near Balkgate, last summer several pairs had their nests.

In the inside of the large wooden vane of Bridgehaugh Mill, Berwickshire, for fourteen successive years, a pair of them have resided. The original nest is still remaining upon it, during that long period, there have been only two other nests built, which are ranged in tiers one above another, nearly all the same size, and plastered with mud mixed with straw. For several seasons their young have been suffocated by the smoke of the fire, which, during summer, is occasionally put on for the purpose of drying corn and barley. After the destruction of their brood in July last, they did not attempt to occupy their old abode, but erected another upon the side of the wall at no great distance from it.

By some naturalists an erroneous opinion has been maintained, that the Chimney Swallows differ from the Window Martins, in their not returning to their old nests, but always building new ones. In the inside of the cowhouse at Balkville, in my immediate neighbourhood, there are two nests fixed on the tiles at the top of the roof, which have been possessed by these Swallows, the one five and the other six years.

In the stable at Heatherfield, parish of Balkgate, Mr. John Waugh, farmer, informed me, that the same nest (out of which I took the young ones that I sent to you) has been occupied by a pair of them, for twenty-one successive years, in which, each season, they have brought up two broods. Du-

ring that time they have only occasionally put a little clay around the edge of it, and repaired the feathers in the inside. It is a curious fact, that in the morning before the door was opened, they were in the habit of flying out and in at a small aperture at the bottom of it. That entrance, however, having been shut up last spring, these active little creatures were determined not to be excluded, for they found a passage through a gutter which was only six inches in breadth by 5½ in length.

For three successive years, a pair of them took possession of the same nest which was built upon the wooden lintel of the coal-house at West-mains, parish of Bathgate, (it was within six feet of a coarse, shaggy hound and dog.) Although it, during the day, was in continual motion, and very often barked, they brought up two broods each summer. In June last, their eggs having been destroyed by rats, they appeared to have had such a dislike at these voracious animals, that they immediately forsook their old residence.

In the corner of Boghead coal-house, and within two yards of the kitchen window, for several years a pair of these birds occupied the same nest. Although the servant passed and repassed within a few inches of it almost every hour of the day, and often during night carried a candle, they appeared not to have been in the least degree alarmed, as they always reared two families each season. Having, however, in August last, attempted to catch them, they did not pay me their usual visit this summer.

In Scotland, at least so far as it has come under my notice, barns and outhouses are the places, in which they generally build. In this neighbourhood, indeed, there is scarcely one to which these birds have a proper access without them; and as they are seldom disturbed, they usually revisit their old haunts.

For their residence, they sometimes make choice of

singular situations. In July last, upon two wooden pegs in the wall of the laundry of Balbardie House, Linlithgowshire, and within three feet of the chimney, a pair of these birds built their nest. In consequence of the house having been for some time past unoccupied, and the door left a few inches open for the admittance of air, through this narrow passage they flew in and out with the greatest dexterity.

In a large unfinished room of a house belonging some time in the parish of Whitburn, nine or ten pairs of them have for several successive years taken up their dwelling; although their nests were close to one another, yet in this social and happy community the greatest harmony prevailed.

In the inside of the skylight of the upper loft of Fordon mill, Berwickshire, a pair of them built their nest. They flew into the room through a broken pane in the window. As the hole by which they entered was very small, it cost them a great deal of trouble to induce their young when ripe to make their escape. By holding flies in their bills at the outside of the pane they at length succeeded. From this snug retreat, they, for eight or nine days, flew out every morning and returned in the evening, in which they with their parents roosted during the night.

Upon the face of a peat-brae, or bank produced by the cutting of peats, in Heatherfield moss, a few years ago, a pair erected their nest, which they occupied for two successive summers.

In the shaft of deserted coal-pits they frequently build.

In Skellymuir, near Dalhousie Castle, there is a large pit cradled with stone, in which between forty and fifty pairs of them have for many years dwelt and reared their young.

to Ballencrieff and Hilderstone coal-pits, in the vicinity of Baltgate, they annually resort. Although their nests were built at a considerable depth, it was surprising to observe with what rapidity and ease they flew up and down.

But they not only frequent abandoned pits, but even those which are in use.

In Colinshiels coal-pit, in the parish of Baltgate, I have seen their nests, which were built between the branders or bars, at the depth of two, three, and nearly four fathoms. Of the banksmen and colliers they appeared to be regardless; even the hatches, which were often drawn up and down, did not annoy them. To their offspring they are so strongly attached, that I have been assured by those who were eye-witnesses of the fact, that they often continued to sit upon them when the pit was full of smoke. In Borbaughlan coal-pit, which is narrower than the former, they likewise bred and rear their young. Another informed me, upon whose veracity I can depend, that he is well acquainted with a man named Malcolm, who, a few years ago, lost his hand in the act of robbing a nest of its young in a coal-pit in the parish of Shotts: the hatch in which he was standing having been unexpectedly drawn up, occasioned the accident. The nest was built at the astonishing depth of fifteen fathoms.

You will observe, from the account which I have given of some of the different situations in which these swallows bred, that, at least in Scotland, the name 'Chimney' is not very appropriate."

Audubon's ornith. Biogr. vol: V. p. 411.

rect their attention to building, materials for which are collected from the brinks of ponds, or the puddle in the lane. Their manner of building is similar to that of the other species, and the nest when finished resembles half a deep dish, and is lined with short straws and feathers, the latter being often collected when floating about on the wind. It is built under arches, gateways, eaves, and water-spouts, against the beams, rafters, and lintels of outhouses, and under wooden bridges. I have seen nests of this species on the rocks about Tantallon Castle, opposite the Bass. The only access which they often have to their nest is through broken windows, holes in the doors, and slits in the walls, which are sometimes so narrow as barely to allow them a passage. The roof which covers the horse-wheel of the thrashing mill appears to be rather a favourite retreat, where they attend to their several duties with the most perfect nonchalance, in despite of the deafening rattle of the machinery when at work. In this county, as you must have observed, almost every farm of consequence has a steam-engine, the usual height of the chimney-stalk of which is about forty feet. A pair of Swallows bred in ours last season ; but I have rarely observed them in such situations; and no instance of their building in the chimney of any dwelling-house has ever come to my ears ! Although for some years back I have not molested them in any way, they are distrustful of man, and the sitting bird immediately leaves the nest on his approach, the neighbours joining in the clamour raised by it, until the intruder retires. Two years ago, one of the nests here was robbed of its eggs, yet in a week after, the female was again sitting on the usual number. When a bird of prey appears, they sound their alarm-notes, resembling *klee-huee*, *klee-huee*, the import of which every little bird understands ; their dark glancing forms are seen cleaving the air with speed; mounting obliquely they dash upon the back of the foe, and rising perpendicularly continue the attack, until the tyrant of the air abandons their hunting-grounds, and the gallant and watchful guardians of the feathered tribes return with songs of triumph. Grimalkin cantering along the top of the wall, is treated in the same unceremonious manner. I have often,

particularly in fine mild evenings, observed that our little band of hirundines assemble in a flock about sunset, and perform beautiful aërial evolutions. From their numbers, I am inclined to think that all the females come abroad, and stretch their wearied limbs. Frequently does the male visit the spot so dear to him, cheering his mate with songs, and probably supplying her with food. His song is always pleasing, and agreeable to my taste, more especially when the crimson clouds in the west foretel the close of day, and the minstrel may be seen perched on a chimney-can, or some other eminence. The descending sun shoots bands of softened light over our quiet valley, gilding the hoary rocks of Traprain Law, and causing the bright chestnut on the Swallow's forehead and throat to glisten, as in ecstasy he moves his body in a semicircle, seeming to throw his whole soul into the performance.

" When the young are hatched, the parents attend to their wants with unwearied assiduity. They are fond of flying about in the vicinity of cattle while feeding, on account of the great number of insects raised by them. When our working horses are turned loose to graze, at 10 in the morning, and again at 6 in the evening, they are in constant attendance, more especially if the weather is cold and cloudy. For hours together they may be seen sweeping over a pond or ditch, along footpaths and lanes, but above all, shady avenues, and amongst trees, where cattle are wont to pass the sultry noon, and returning to feed their young every two or three minutes.

" The first brood is fledged about the same time as that of the White-rumped species. They follow the old birds, uttering quick expressive notes. At a given signal, one of them rises obliquely, and meets its parent at an angle. Hovering for a few seconds, it greedily devours the proffered mouthful. I have never seen them fed when perched on a tree or paling, as mentioned in the Natural History of Selborne ; but I have seen them when tired settle in such situations, and rise on wing to receive food from their parents. The young are soon left to shift for themselves. They frequent churches, manor halls, distilleries, and other lofty buildings. In this district, Linton distillery is the favourite place of rendezvous. About the second

week of September, the second brood and the parents join them. They now roost exclusively on trees, which they usually quit at sunrise, and resort to some sunny roof, where the livelong day is spent in luxurious idleness, singing, and satisfying the calls of hunger. Sometimes the leafless bough of an old tree is selected for this purpose. Every morning parties of various numbers leave the main flock, and betake themselves to corn-fields in the neighbourhood of farm-buildings. Here they almost invariably choose the chimney of the steam-engine as the centre of their frolics. At a given signal, the whole party rise on wing, twittering and singing in chorus. After a short excursion, they return, most of them perching on the top, and the rest on the side of the walls, the whole forming a scene on which I am never tired of looking. But if you would contemplate this mysterious gathering in the true spirit of the season, take a solitary ramble along the border of the wood that skirts the meadow, the few wild flowers which still linger under the shade of the tall hedge-row have a forlorn sweetness and beauty, the fields are checkered with gold and green, the tints of the foliage are gorgeous beyond description, all things speak of maturity and subsequent decay, there is an exhilarating keenness in the air, and yet the sober stillness of an autumnal day sheds a gentle sadness over the scene, which even the distant song of the reapers, and the gambols of the swallows hovering over the pool, and perching on the old oak, fail to dispel. The spirit of melancholy sighs through the gay foliage, sits in impressive silence on the motionless curtain of thin grey clouds, and broods over the landscape, from which stern winter will soon sweep every object that charms the eye. Warned by the lengthening shadows, and the increasing chilness of the air, the swallows join their companions, with whom they frolic for some time previous to retiring to the trees. When the morning has at last come, when they must bid a long farewell to their native land, they seldom, as is their wont, divide into parties, but fly off in a body for the green meadows of merry England, there to linger for a few weeks longer, before they finally depart for the evergreen borders of Africa. On the morning of the 24th September last, a flock passed over our reapers, casting no

looks behind on the rural homesteads, which they once held so dear, but rushing onwards in an undeviating course, and maintaining a sullen silence. I marked their flight until they blended with the blue ether, and thought of the bright days which were gone, and the storms which were soon to come. A few stragglers often remain some time behind. The latest that I ever saw was a solitary individual in our stack-yard, on the afternoon of the 7th October 1839."

Young.—The young when fully fledged resemble the old birds, but with considerable differences. They are easily distinguished by the shortness of the lateral tail-feathers, and the inferior gloss of the plumage. The forehead and throat are dull pale brown, the lower parts light grey slightly tinged with red; the parts which in the adult are splendent with steel blue, are brightly glossed with green, and the feathers on the rump dull, without reflections.

Remarks.—If this species be identical with the American bird bearing the same name, as it appears to be, although several ornithologists have considered it different, its distribution over the globe is very extensive. Some author having stated that Swallows remain all winter about the Carron Founderies, being fostered by the constant heat kept up, I have thought it not absolutely foolish to inquire if he had any grounds for his assertion. Having in the spring of 1840 delivered a course of Zoological Lectures in Falkirk, I visited these celebrated works, but found no Swallows in their vicinity. No person in the district, in so far as I know, ever heard of such a phenomenon; and no Swallows were to be seen there up to the 16th of April, ~~when I retreated—with flying colours.~~

Genus III. Chelidon.

1. Chelidon urbica. Linn. The House Martin.

~~HIRUNDO URBICA. THE WHITE-RUMPED SWALLOW.~~

HOUSE SWALLOW. WINDOW SWALLOW. MARTIN. ~~HOUSE MARTIN.~~ MARTINET. MARTLET.

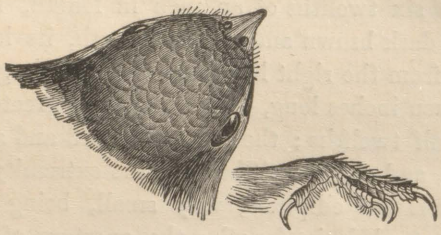


FIG. 267.

Hirundo urbica. Linn. Syst. Nat. I. 347.
Hirundo urbica. Lath. Ind. Orn. II. 573.
House Martin. Mont. Orn. Dict.
Hirondelle de fenêtre. Hirundo urbica. Temm. Man. d'Orn. I. 428.
Martin. Hirundo urbica. Selb. Illustr. I. 123.
Hirundo urbica. House Martin. Jen. Brit. Vert. An. 158.

Head, hind-neck, and fore part of the back glossy steel-blue; rump and lower parts white; tail deeply forked; tarsi and toes feathered.

House

MALE.—The Martin, ~~or Window Swallow, or, as it may with propriety be named, the White-rumped Swallow,~~ is somewhat smaller than the ~~Red-fronted species,~~ Common or Chimney Swallow, from which it is readily distinguished when on wing by the white colour of part of its back, but which it closely resembles in its habits. The body is ovate, slightly compressed, the neck short, the head rather large. The bill is shorter and a little higher than that of the preceding species, but otherwise similar; both mandibles being straight, the tip of the upper slightly declinate, and the notch, although small, dis-

tinct. The mouth is five-twelfths of an inch in breadth; both mandibles are slightly concave internally, with a central prominent line; the palate is flat, and but slightly arched; the tongue short, triangular, three-twelfths of an inch long, emarginate and papillate at the base, its tip slightly bifid. The œsophagus is two inches and a quarter long, and gradually contracts to a diameter of two-twelfths; the proventricular glandules are half a twelfth long, and about half as broad. The stomach, a gizzard of moderate power, and of an elliptical form, is six twelfths of an inch in length, its cuticular lining thin, dark brown and nearly smooth, its lower muscle not distinct from the right lateral, its tendons large. The intestine is seven inches long, rather wide, its greatest diameter two and a half twelfths; the cœca a twelfth and a half, of an oblong form, and eight-twelfths from the extremity.

The nostrils are elliptical, very small, being only three-fourths of a twelfth in length; the aperture of the eyes a twelfth and a half in diameter; that of the ears two and a half twelfths. The feet are very short; the tarsus extremely short, rather stout, with six anterior scutella, but thinly covered all round with feathers; the toes are rather short, and very slender, scutellate above, but thinly feathered, the first rather stronger and having six scutella, the second eight, the third twelve, the fourth twelve; the claws are moderately stout, arched, much compressed, laterally grooved, acute, that of the first toe shorter than that of the third.

The plumage is very soft, and blended; on the head and part of the back splendent, but elsewhere without lustre; the feathers ovate and rounded, without plumule. The wings are extremely long; the quills eighteen, the primaries nine; the first and second equal and longest, the rest rapidly graduated; the primaries tapering to a rounded point; the secondaries short, obliquely rounded and emarginate. The tail is rather long, and deeply forked, of twelve nearly straight feathers, the lateral longest and exceeding the medial by about ten-twelfths of an inch.

The bill is black, the mouth yellow; the iris brown; the scutella and claws pale yellowish-grey. The upper part of the

head, the hind-neck, the anterior half of the back and the scapulars, with some of the small wing-coverts, are glossy steel-blue, with greenish and purplish reflections; the hind part of the back is white, with the shafts dusky, and all the lower parts are white excepting a transverse dusky mark anterior to the wings; the shafts of the lower tail-coverts, and the lower wing-coverts, which are greyish-brown edged with brownish-white. The wings, tail, and upper tail-coverts are chocolate brown, slightly glossed with greenish; the inner secondaries narrowly tipped with white. The concealed part of the plumage is dull greyish-blue, but the feathers of the hind-neck and fore part of the back have a white patch towards the end.

Length to end of tail $5\frac{8}{12}$ inches; extent of wings 12; wing from flexure $4\frac{6}{12}$; tail, middle feathers $1\frac{9}{12}$, lateral $2\frac{8}{12}$; bill along the back $\frac{3\frac{1}{2}}{12}$; along the edge of lower mandible $\frac{6}{12}$; tarsus $\frac{5\frac{1}{2}}{12}$; hind toe $\frac{3}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; second toe $\frac{4}{12}$, its claw $\frac{2}{12}$; third toe $\frac{5}{12}$, its claw $\frac{3}{12}$; fourth toe $\frac{4}{12}$, its claw $\frac{2}{12}$.

Female.—The female cannot be distinguished from the male unless by dissection, the size, proportions, and colours being similar in both.

Length to end of tail $5\frac{6}{12}$ inches; extent of wings 12.

Variations.—Adult individuals very seldom exhibit any remarkable differences, although, as in the preceding species, accidental changes to white or cream-colour sometimes occur.

Changes of Plumage.—This species arrives in full plumage, and departs before moulting. The tints merely fade a little as the season advances.

Habits.—The ~~White-rumped Swallow~~ House arrives generally a few days later than the Red-fronted, but sometimes the two species make their appearance together. In the south of England the period of its arrival varies from the 10th to the 20th of April; and in the south of Scotland, from the 25th of that month to the 5th of May. It is more widely dispersed than

the preceding species, for, besides occurring in the neighbourhood of towns, villages, and farm-buildings, in the lower and populous parts of the country, small colonies establish themselves on the inns and larger houses in many of the remote valleys, where the strolling naturalist is often delighted as well as surprised by the sight of them. In the valleys of the upper districts of the Clyde, the Tweed, the Dee, and the Tay, the presence of these beautiful and lively birds gives an intimation of our approach to the haunts of civilization and commerce, as we emerge from the moors and wild glens of the pastoral regions.

The ease and rapidity of its flight, however ~~marvellous~~, excite no astonishment, as we are daily in the habit of witnessing them; but a true lover of nature can nevertheless contemplate its airy windings for hours with delight. The evolutions of this species resemble in all respects those of the Red-fronted Swallow; but its flight is perhaps somewhat less rapid, although it is certainly very difficult to decide with accuracy in a comparison of this kind. Its sweeps and curves however seem to me to be less bold, or rather less extended; but its dexterity is equally remarkable. It mingles in its sportive-like pursuits with both the other species, although each kind seems to give some preference to the society of its own members. The influence of the weather on the flight of insects causes it to observe the same selection of places as they; so that in calm and cloudless days it flies more in the open air, in windy weather more in the shelter of hedges and walls, and in damp evenings it skims over the grass and corn.

Its ordinary cry is a rather loud chirp, which it frequently emits, more especially when it flies in the vicinity of its nest. It has been called a twitter, but the syllables which it most resembles are *chir-rup*. When flying over a field, or under the shelter of trees, with its young, it has a softer and more pleasant chirp, which is responded to by them; and in calling to one to come up and receive an insect, it utters a repetition of its notes, so as to produce a low chitter. Its song is loud enough to be heard in calm weather at the distance of three hundred yards, and is cheerful, although not remarkable for

melody. It is often emitted at intervals while the bird is on wing in the neighbourhood of its nest, and is sometimes heard more continuously, in fact for ten minutes or more, when perched on the roof of a house or other elevated place.

It is always amusing to watch a group of ~~Swallows~~ Martins in active pursuit of their tiny prey. Let us stand for a little while at the end of this pond, and observe them. Both species are seen, the ~~Window~~ Common Swallow and the ~~Chimney Swallow~~ House Martin, the former more numerous. Their flight and actions however are precisely similar. Selecting an individual, you see it advance over the surface of the pool, at a height perhaps of two inches, its wings slightly raised, to prevent their hitting the water. It picks up an insect, proceeds, suddenly stops, stretches up its wings almost perpendicularly, dips its breast, seizes a fly, advances again, secures an insect on wing, and now comes up, but, on perceiving you, wheels away, and with devious and random flight passes over the corn-yard, then curves toward the farther end of the pond, skims along, and performs the same actions as before. They seldom make much noise on such occasions, a few chits now and then being all that you hear.

Although the feet of this bird are very small, it can settle without difficulty on a wall top, a roof, the branch of a tree, or on the ground, and is capable of walking, although in an uneasy and rather ungraceful manner. Unlike the Swift, both species rise without difficulty from a flat surface.

The ~~White-rumped Swallow~~ Martin begins to build or repair its nest about the middle or towards the end of May. It is, or has been, a common, but erroneous belief, that Swallows collect the materials of which their nests are composed when on wing; that they skim over water, dip into it, and then drop in like manner over a dusty road; that thus they gather mud, which they remove from their breast with their bill, form into pellets, and apply to their nest. All this is mere fancy. Swallows shot in the early or middle part of summer have the feathers on their breast perfect, and in no degree exhibiting indications of having been soiled by mud; they dip into the water solely for the purpose of taking up insects, as I have satisfied myself by close observation; and, lastly, they obtain mud in quite a

different manner, for they alight by the edge of a pool, or brook, often on the street or road after rain, select a portion, seize it with their bill, fly off to their nest, and apply it in its wet state to the edge of the unfinished crust, which they thus gradually build from the bottom upwards, until it is completed. The different pellets thus carried are discernible in the finished nest, which is externally knobbed or tuberculated, generally very friable when dry, and without any intermixture of glutinous matter, so that the copious application of their saliva in the manner of cement, which many authors allege to take place, is I think conjectural. Straws and feathers they pick up in the same manner, that is by alighting, and seldom while on wing.

However pleasant it is to have a Swallow's nest in the corner of one's window, to see the birds constantly flying about, and hear their pleasant notes, yet when a whole colony has settled on the house, and the corners of all the windows are occupied with nests, one is apt to consider them rather troublesome, especially when the panes become crusted with their dung. They may be prevented from building in such places by applying soft soap or tallow to them. Mr Rennie, who is indignant at some of his "northern neighbours" for endeavouring to banish the Martins from their windows, asserts "that no sincere lover of nature—nobody who has music in his soul, will be apt to adopt the expedient." Unfortunately for this theory, the only person of my acquaintance who adopted it on a large scale, is one of the most fervent lovers of nature that I know, although, like our "southern neighbours," he admires cleanliness, and would be apt to brush away the most beautiful cobweb. The greatest patron of the Martins that I have met with is the Earl of Traquair, whose benevolent disposition induces him to extend his protection to all the birds that choose to reside on his domains, where the Blackbirds and Thrushes feast unmolested on the cherries, the Curlews feed on the lawn, and the wild Mallards mingle with the domestic Ducks in the pond. Having with them shared his lordship's hospitality in the autumn of 1839, I counted under the eaves, and in the corners of the windows of Traquair House, an hundred and six nests, all tenanted, besides several that had been deserted, in-

jured, or taken possession of by sparrows. It was a continued treat to see the lively creatures feeding their young and skimming over the grass in search of insects. He informed me that very frequently they reared only one brood, and that in very dry seasons they found great difficulty in building their nests, a pair of them having worked one summer three weeks in his bed-room window, without accomplishing their object.

Most commonly the nest of this swallow is placed in the upper corner of a window, often also under the eaves of outhouses, and in similar situations, where it is sheltered from above, sometimes on the face of a rock, whether on the seashore or inland. The only instance of the latter kind of situation which has occurred to me was in an old limestone quarry, at the Roman Camp, near Dalkeith. When in the corner of a window, it is of a rounded form externally, flat on the adhering sides, rectangular above, and has a roundish or transversely oblong aperture at the top, almost always on the sheltered side, or that next the middle of the window. I have seen several instances in which the aperture was at the outer edge of the window, and sometimes it has a kind of neck, or the mouth projects an inch or more. The nest is usually large, having an external diameter of from six to eight inches. The outer part of one examined by me at Bield Inn, in Tweedsmuir, in August 1834, consisted of pellets of friable sandy mud, not in the least glutinous, intermixed with small, generally angular pebbles or gravel. Into this outer crust were thrust numerous straws or fragments of stems of grasses, which became free internally, and were circularly disposed. Within was a layer of wool, partly interwoven with the straw, and lastly a thick bed of large feathers of the domestic fowl. Another nest from a village near Edinburgh, is six inches in diameter externally. The outer shell is a solid mass of fine loam, which has been built of pellets in the form of soft mud, so that the outer surface presents horizontally compressed mammillæ. The average thickness of this crust is seven-twelfths of an inch. It is quite friable, and if any glutinous matter has ever been intermixed with the mud, it has entirely disappeared, but it is in some measure held together by a considerable intermixture of short

straws. The next layer is of straws of various kinds, mostly decayed. This is followed by a thick layer of wool, which is succeeded by a great quantity of hogs' bristles, cows' hair, human hair, a piece of linen, a bit of tape, and a number of feathers, chiefly of the domestic fowl. Other nests which I have examined were similar. In general, within the outer crust of mud there are two layers, the outer of straw, the inner of feathers of domestic fowls, often mixed with wool, hair, and other soft substances. The eggs, four or five in number, are of a longish oval form, rather pointed, about nine-twelfths of an inch in length, and six and a half in breadth; their colour pure white, without spots.

The construction of the nest occupies from six to ten days. Two broods are generally reared in the season, the first being abroad by the beginning of July, the other about the end of August. During incubation both the parents are frequently seen in the nest, and at all times they repose there at night. When the young are nearly fledged, they frequently appear at the edge of the aperture, and are occasionally clamorous for food, which is brought to them sometimes with astonishing rapidity. For some days after they have left the nest, they fly about in its vicinity, and are fed by their parents. It is amusing to see the expedients to which recourse is often had to induce them to leave the nest, the parent birds sometimes pushing or dragging them out, but more frequently enticing them by shewing how easy it is to fly away. Very frequently the young betake themselves to the upper corner of a window to rest, clinging for a short time by means of the feet and tail; and in this situation I have seen them fed. For some time after they have come abroad, they return to the nest at night, reposing there with their parents. To these particulars derived from my own observation, I add the ample contributions of Mr Hepburn and Mr Durham Weir.

"The House Swallow or Martin," Mr Hepburn writes, "arrives at the village of Linton, on the Tyne, in the last week of April, though in 1839 a few were seen by the 17th of that month. For the last two years they have not appeared at our onstead before the 30th of April. They usually commence

House Martin.

building in the first week of May, but are sometimes much later. On the 3d of June last, a party of six arrived here, and spent the whole day in examining the eaves of the dwelling-house, barns, stables, and granary. The following morning they commenced a general foundation for their three nests, beneath the water-spout on the back wall of a wing of the house, having an eastern exposure. Each pair worked at a particular part, and before noon it presented one continued line of mud. By the 13th two pairs had left off working, when their nests were nearly half-finished. The only remaining pair brought their labours to a close on the 17th. Suitable materials for the nest are procured from the banks of the pond or the puddle in the lane. If you follow them thither, you will see much to increase your regard for these pretty birds. There they come, sailing placidly over the tree tops; now they descend so as almost to sweep the surface of the little sandy pool; some alight, while others suffer themselves to be borne away on the breath of the summer's wind, again to advance and exhibit the same beautiful evolutions. When alighted, if the surrounding mud is not suitable, they walk about with short steps, till the object of their visit is obtained, frequently seizing a small piece of straw or grass at the same time. When both are not to be procured at once, they will frequently carry the straw to the mud, temper it well, and then carry off a portion. Let us now follow them to their nest. Seated in the room, you give them no uneasiness. You see that yesterday's work is now dry, and sufficient to allow one bird at a time to perch on it. Still using its tail planted against the wall, or, when the nest is somewhat advanced, against its walls, it deposits the materials by giving its head a rapid wriggling motion, by which means the mud slides gently into the crevices of yesterday's work. It now perhaps retouches the whole of the newly deposited materials. At particular stages of the work much material is lost. Not unfrequently will one of the birds arrive with a load, and drive off the other, even before its burden is deposited, and sometimes the worker will snappishly resist, the new-comer will depart and describe several additional turns and windings, for so far as my little experience goes, these birds rarely if ever fly directly to and from the mud-hole and their

nest. The quantity of mud carried in the mouth is inconsiderable compared with that carried on the sides of the mandible. They never alight on the nest without twittering. At noon, if the weather is sultry, they betake themselves to the fields, or taking a dip or two in the pond, they sun themselves on the house-top for half an hour or so. Yet the latter act is not always a consequence of the former. Previous to their hawking about for food, sometimes one returns after the lapse of an hour or two, retouches the work, and, if it is sufficiently advanced, will sit for ten minutes or so to consolidate the materials. Should the day prove stormy, then they do not appear; if it clear up, then they commence their labours. Should it prove rainy, cold, or windy, then they work but little all day long. They seldom recommence work till four or five in the afternoon, sometimes not till six. When they cease for the day, at the beginning of the work especially, both leave this place, and probably go to Linton, which is some miles distant. As the work advances, one and then both will sit all night, sometimes even when windy and cold; but on such occasions they generally disappear.

"To see these household birds constructing their nests in the corners of our windows is a matter of such common occurrence as to excite little more than a passing notice even from the field naturalist; but let any one watch, as I have often done, the progress of their labours from the instant that the first knob appears on the wall, till the last feather is laid in the finished structure, and he will see much to admire in the instinctive science, the industry, and perseverance, which they display. I am aware that much has been written on this bird, but in studying the habits of even our most common species, there is still much to be done. In confirmation of the above remarks, I will here present some extracts from my journal.

"May 1st, 1839.—The Martins began to work by daybreak; worked till noon, sported about till 5 P.M., worked till 6, then disappeared. Bright sunshine. Wind W. Therm. 62° at noon.

"2d. Martins appeared at 11 A.M., an hour after began to build a little, at 3 P.M. disappeared. Cloudy and cold. Wind W. Therm. 56°.

House Martin.

" 3d. Martins worked very little all day ; sometimes in frolic they alight on their neighbours' nests, without doing them any damage. Cloudy. Wind N.W. Therm. 53°.

" 4th. No Martins seen to-day. Rain. Cloudy and cold. Wind N.W. Therm. 47°.

" 5th. A most delightful morning. Martins built briskly till 9 A.M., when a thick mist accompanied with rain and a cold wind caused them to retire till 5 P.M., when the sky again became bright, and they worked for an hour, then sat on the nest for some time, but soon flew off, returned at half-past six o'clock, when side by side they squatted in the shell, where they remained all night. The wind was piercing cold, and contrary to their usual practice, not a twitter was emitted. Wind. E. Therm. 45°.

" 6th. Cold and cloudy till 5 P.M. Only one pair returned as usual, the other has not been seen for two days. The former built for an hour, then disappeared. The sides of the nest now begin to slope inwards. When they deposite the materials, they place the point of their bill on the outside, then draw it inwards with the usual vibratory or wriggling motion. Cold and cloudy. Wind E. Therm. 45°.

" 7th. The pond was covered with ice this morning. Martins did not build till it was thawed. Although the lower half of the nest is scarcely finished, yet are they rapidly building up the part nearest to the rivets. The walls and the corners are nicely rounded off, thus giving additional security to the whole fabric. In finishing off the top of the wall, sometimes the bird will cling to the outside, and at other times will most materially support itself in the inside by using both the wings and tail as supports. When their bill comes in contact with the old and dried materials, a harsh rustling sound is produced. When busy, they carry materials to the nest about once in a minute and a half. Very busy all day. Both remained all night. Sunny. Wind E. and W. Therm. 56°.

" 8th. Martins worked very constantly, still following out the same plan of building, very little mud being deposited near the window. Both sat all night. Bright sunshine. Wind W. Therm. 58°.

" 9th. Martins worked none. Both remained all night. Very cold and cloudy. Wind W. and N. Therm. 42°.

" 10th. Martins began to build about noon, but made very little progress. Only one of them remained all night. Cold and cloudy. Wind N.E. Therm. 42°.

" 11th. Martins built a little, both sat all night. Cloudy. Wind N.E. Therm. 53°.

" 12th. Martins built a little. Nest nearly completed. Disappeared towards evening. Cloudy. Wind N.E. Therm. 55°.

" 13th. Martins built very little, disappeared early. Cloudy. Cold. Wind N.E. Therm. 45°.

" 14th. No Martins. Snow showers from half-past 7 A.M. till 10. Cloudy and cold. Wind N.E. Therm. 43°.

" 15th. No Martins. Very cold and cloudy. High wind, N.W., accompanied by heavy rain. Therm. 45°.

" 16th. No Martins. Rain. Wind N.W.

" 17th. No Martins. Very cloudy. Wind N.W. Therm. 50°.

" 18th. Martins appeared about 1 P. M., worked for some time, remained all night. Cloudy. Wind S.W. Therm. 50°.

" 19th. Martins finished building their nest, remained all night. Cloudy. Wind N.W. Therm. 58°.

"Now that their labours were brought to an end, I entertained hopes that the structure would last them many years; but on the 23d of June, during a heavy and continued rain, almost the whole of it fell to the ground, together with the young birds which it contained. A short time before the catastrophe occurred, I observed the old birds hovering about, and expressing great uneasiness. They almost immediately left this place, but returned the following day, and spent it in hawking about, and examining the window. Next morning they commenced repairing the nest. On the morning of the 26th they made great progress, but after 9 A. M., when rain began to fall, they worked very little. On the 30th, they advanced rapidly, and both remained sitting on the nest all night. On the 1st of July they finished it. They twittered incessantly all the evening till it was dark, and now and then preened each other's heads, as seated side by side they prepared to pass the dark hours. On the 18th

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of the same month, in the evening, during a great storm of wind and rain, part of the upper front fell down, carrying with it one of the eggs, in which was an embryo chick far advanced. The old birds, as usual, fluttered about, uttering plaintive cries. Early next morning they began to repair the damage, although it rained heavily all day. Part of the lining hanging over the side was incorporated with the new layers of mud. The urgency of this case required that they should work during bad weather. Throughout the day, there was generally one sitting on the nest, whilst the other laboured assiduously. Kindly was he welcomed by his mate, who sometimes during his absence nibbled and retouched the materials which he had just deposited. In a fews days it was finished, and shortly after the young were born.

" When their nests are destroyed, these birds do not always rebuild them, but sometimes forsake the neighbourhood entirely. On the 20th of July last, I observed a pair of Martins carrying mud to support their tottering edifice, applying it to the base. In May 1838, a pair of Martins built their nest in the staircase window. They reared two broods, and departed in due season. Last season, about the period of their arrival, a pair of House Sparrows took possession. The female I suspect was barren, as up to the 27th of May no eggs were deposited. In the morning of that day, and without any squabbling, a pair of Martins took possession of the nest, and in a few days the female was incubating. When the Martins' nest in one of the front windows fell on the 23d of June, I placed the young on some cotton in a little basket in their native window, covering them with a large sheet of brown paper; but during the remainder of that day, and on the following day, their parents took no notice of them. Seeing that the poor creatures would perish of hunger, I placed them on a table in the room, and fed them with common house flies for two days. On the evening of the 26th, I resolved to try an experiment. Taking up the young ones, I pushed them gently into the nest in the staircase window, which contained young a few days old. It was about 8 P. M., and rain was falling heavily at the time. No sound was heard, save the cheeping of the young birds, and the dashing of the

storm against the window-glass. A minute elapsed, when forth rushed the parents, and darted wildly about, shrieking their alarm notes, and again and again wheeled up to their nest, until at last they drifted away in the storm. I watched them till they disappeared about half-past 9 o'clock. During all this time they only twice summoned up courage to look into the nest. Next morning I was rejoiced to see them attending assiduously to the young ones. Toward night, however, they disappeared, and as they never returned, their progeny perished of hunger. These two instances do not redound to the honour of the species.

"Besides the places above-mentioned, in which they fix their nests, I have seen them in arches, once against a rafter, immediately under the ridge hole of a shed, on another occasion, in the south-east angle of the wall of a house, at the distance of eighteen feet from the ground, and about six or eight feet from the eaves. Although quite exposed, it bore with impunity all the storms by which it was assailed, and its owners raised two broods in it. I am credibly informed that they breed about the rocks near Tantallon Castle, opposite the Bass Rock. I have never seen its nest placed so low that you could reach it when standing. The favourite haunts of this species are towns and villages, near large streams and lakes. Windows appear to be their favourite places for building. It is not uncommon to see a nest in each corner. I have frequently seen them where their owners were obliged to pass round a large tree before reaching them. In such a situation as the corner of a window, it presents the appearance of the quarter of a rude globe, in most cases, if not always, somewhat produced about the entrance, which is always on the side next the window. It is usually finished in twelve or fourteen days. When built in a sheltered situation, it will last for years, and is occupied every season probably by the same pair. It is sometimes lined with moss and wool, in other instances with soft straw and feathers, and frequently with a mixture of the four kinds. The straw I have seen them collecting from the tops of the out-houses. From three to five white eggs are deposited, and in the intervals the parents pursue the gnats in

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some quiet glade or valley, amongst the cows grazing in the meadow, or the lambs at play on the hillside. If the day is warm, they will dip their snowy breasts in the glassy water, and then perch on a paling or housetop, and preen their feathers. They frequently enter their nest, where they twitter or warble incessantly. If I recollect right, their song may be syllabled thus: *chir-r-ruee*, *chur-r-ruee*, *ruee*, *ruee*. When incubation commences, I suspect that the male feeds his mate, as he frequently visits her, and then the twittering generally subsides for a short time. About sunset I have frequently found the nest deserted; so it is probable that she then takes some recreation, and stretches her wearied limbs. In two instances which came under my observation, twenty-six days elapsed between the finishing of the nest and the appearance of the young, which is announced by the broken egg-shells and their exuvia wrapt in its tough kind of jelly, both of which the birds drop over the side. After the lapse of some days the young perform a somewhat similar operation for themselves. Their wants are supplied with unwearied assiduity.

"On the 5th of August, having a little spare time, I devoted it to the observation of a pair of these birds feeding their two young ones. In half an hour at noon, they fed them twenty-two times. The old birds sometimes clung to the entrance, and at other times entered the nest. They were welcomed with an incessant *cheep cheep*. Part of the food is apparently carried in the œsophagus, and it requires considerable muscular effort to disgorge it. They retired to roost about 8 P. M. The monotonous call of the young, heard for about an hour afterwards, is occasionally relieved by the gentle twitter from the parents. On the 19th of August, in the course of an hour in the afternoon, the young were fed nineteen times. The young one whose turn it was to be fed sat in the entrance, to which the parent clung when feeding them. Should any portion of food remain about the bill of the young, or drop from its mouth, it is instantly seized by its companions. I have frequently observed young Martins nibbling the walls of their home, as if to procure sand to aid digestion. The following morning, about eight o'clock, immediately after my return

from the fields, I observed the old birds dashing up to the window, then describing short curves in the air, and repeating a note, the meaning of which could not be misunderstood. I knew from experience the young were about to take their flight. One of them balanced itself in the entrance, looked timidly into the void, considered the risk for sometime, and then allowed its fellow to take its place. During all this time the parents kept diving about, within a few feet of the nest, and often fluttering within a few inches of the entrance, and endeavouring by many winning gestures to induce their charge to follow them. The remaining bird also, after sitting for some time, distrustful of its powers, retired, and the first one once more appeared. Opening and shutting his wings, and often half preparing to retire, he at length summoned up all his resolution, sprung from his perch, and with his self-taught pinions winnowed the air. He and the parents, who were in ecstacies, returned to the window, and, being joined by the other young bird, they all day long sported chiefly about the tree tops, till seven in the evening, when they re-entered the nest. The following day they were again sporting about, and the young were repeatedly fed by their parents. In the evening, about six o'clock, a most interesting scene occurred. Contrary to my wishes, the nest was pulled down. On their return, each dashed up into the corner in which it had been fixed, and then without uttering a sound they all wheeled about, and again successively examined the place. Shrieking their alarm note, they now darted wildly over the tops of the laurels and hollies, advanced and retired. Each examination served to increase their rage or alarm, and now a dozen of their neighbours from New Whittingham arrived, examined the window, and joined the injured family, thereby greatly increasing the confusion and uproar. If one clung to the window corner, two or three settled on his back, and down they came. In this manner they kept hovering about for an hour, when they disappeared. The family group frequented our fields for some days, and then withdrew for the season.

" In several instances I have seen the neighbours add their inducements to those of the parents, when the latter invite their

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young to leave their home. In a family of five, three left the nest a day before the others. If the happy day prove fine, they seldom return to the nest till sunset; if otherwise, I have seen them return two or three times a day to rest themselves. The first brood, which is generally abroad by the middle of June, live apart. The second brood is fledged by the end of August. They and their parents join the first brood and their companions, at Linton Distillery, when some hundreds of the species are to be seen. The remainder of their stay is spent in short aërial excursions, in sunning themselves on house-tops, in feasting and song; until, about the third week of September, when they bid farewell to the scenes of their youth, which many of them are never again to behold, and away they speed in a body far towards the noontide sun."

"Martins," says Th. Durham Weir, Esq., "have built their nests in most of my windows for many successive years. The panes of glass being greatly soiled by the droppings of the young birds, I resolved that I should prevent them from troubling me next season, and accordingly took steps to that effect. They went off in a pet, and to my astonishment did not return for four years, at least they did not attempt to build, for they only hovered about the house for a few days, and then took their departure. This shews their wonderful sagacity and recollection. They must have remembered the harsh way in which I had formerly treated them, and advised their companions, in some way, of which we cannot form a right conception, to beware of taking up their residence at the abode of so hard-hearted a fellow. I may remark, that had I then been so keen an ornithologist as I now am, I would not have treated these interesting visitors in such an unfriendly manner. In 1835, being very anxious to procure some good specimens for stuffing, I went into the town of Bathgate, late one evening, and with the aid of a ladder caught several pairs sitting on their eggs. As they were all more or less injured in the feathers of their tails, no doubt owing to the way in which they build their nests, I immediately set them at liberty. It is very remarkable, that next year not a single nest which I had searched was reoccupied, and the windows were completely deserted, and have been so

ever since (September 1839.) In one of the windows, however, in which there were two nests, I had left one nest untouched, and to it a pair of Martins, perhaps the former occupants, returned the following season, and brought out young ones. This is another proof of their astonishing memory. In the summer of 1836, six pairs built at Boghead. One evening when nearly dark, I caught a pair on their nest, but as they did not please me, I immediately put them away. No sooner, however, did they escape from my hand, than they set up a cry of alarm, upon which I heard the other Martins fly out of their nests, uttering the same sound; and though they had been for a considerable time on their eggs, they never returned to them, but left the neighbourhood altogether. Birds in general, it is said, 'are wise in their selection of situation.' 'The choice they make,' says the celebrated Wilson, in his interesting account of the American Chimney Swallow, 'bespeaks more than mere unreasoning instinct, and does honour to their discernment.' With the Martins which have frequented my house, this has indeed been the case. Although for several years they have built in the north, east, and south windows of it, I have never seen them attempt to build in those exposed to the west. The length of time which they take in the erection of their nests seems to depend on the state of the weather or their own inclinations. On the 20th of May 1837 three pairs of them began to build. In the forenoon of the 6th of July one of their nests was completed, the other two were not finished until the 10th and 11th of the same month. I have, however, seen them inhabited in the course of six and eight days, particularly when the former ones had been washed down by heavy showers of rain. A sparrow which for several years had built on the top of a leaden water-pipe, having been disappointed of his old situation, was determined to remain as near to it as he could. He watched the Martins for eight days with unceasing care whilst they were erecting their abodes. No sooner was the outwork of the first of them finished, than he took forcible possession of it. During the greater part of a day, I observed the proprietors with six of their friends attempting to put the invader out, but their endeavours proved fruitless, as

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he made a determined resistance, and finally was victorious. He and his partner finished the interior of it, in which they reared their family, and lived with the Martins afterwards on terms of good neighbourhood. 'The whole account given by Avicenna, Albertus Magnus, Rzaczynski, Batgowski, Linnæus, and other naturalists with respect to these birds building up sparrows into their nests of which the sparrows had taken possession, is,' says the editor of the volume on the Architecture of Birds in the Library of Entertaining Knowledge, 'a fanciful legend, for the sparrows with their strong bills would instantly demolish the thickest wall which the swallows could build, instead of quietly permitting themselves to be imprisoned.' In opposition, however, to this bold assertion (and it ought to be a warning not to condemn too rashly the statements of others), I am enabled to record three well authenticated facts of the kind. A few years ago in the window of the second story of a house in Linlithgow, inhabited by Mr James Brown, heckle-maker, a pair of Martins built a nest, which was taken possession of by a female sparrow. In attempting to dislodge this bold intruder, a dozen of their companions came to their assistance. After many severe struggles they were unable to effect their object. For her rash conduct, however, they were determined to make her suffer. They agreed to entomb her alive by closing up the entrance with the mortar which they use in building their nests, and in this they succeeded. Mr James Douglass, slater, with whom I have been for a long time acquainted, and upon whose veracity I can depend, assured me that he was a spectator of the occurrence, and that he, in the presence of several individuals, some of whom he named, took the dead bird out of the nest. The truth of it is further confirmed by Mr John Ray, nailer in Linlithgow, who told me that he was also present when it happened. At Bathgate mill, in June 1835, another instance of the same kind occurred. A male sparrow having persisted in occupying the dwelling of a pair of Martins, they, with twenty of their kindred, finding that they were unable to force him out of it, shut him up with mortar. Mr John Sayer, the miller, his brother, and the engineer

informed me that they were eye-witnesses of the fact, and that they had the bird in their hands after it had been taken out. The same disaster happened to another sparrow in a nest, which was built in the window of the house of Mr Henry Reid, grazier in Bathgate.

" These birds produce two broods in the season ; the young of the first brood do not desert their parents when they have a second family, but as many of them as can be rightly accommodated roost with them during the night. One evening in August last I caught in a nest the male and female with four of their second brood and two of the first.

" It is a remarkable fact that they annually return to their old residences. In the town of Bathgate I know two nests which for the last three years have remained entire, and have been regularly tenanted each season, but whether by the same inmates or not I cannot affirm ; Captain King has however been able to prove that the same pair of Martins do sometimes reoccupy their fomer nest. In his narrative of a journey to the shores of the Arctic Regions in 1833, 1834, and 1835, in Vol. I. p. 97, he makes the following statement with respect to these birds :—' That the House Martin not only visits the same place, but the same nest year after year, is a fact which I ascertained by experiment. While residing in Kent, about ten years ago, having selected a detached nest, I fastened a small piece of silk round one of the legs of its inmate, then sitting upon eggs. The following season the bird returned, and with the garter still affixed, was secured in the same nest,—a convincing proof of the instinctive knowledge attributed to it.' In further confirmation of the above statement I may mention that at the windows of my house, during the month of September 1838, I caught several pairs of Martins, and fixed small silver rings round their legs. In my immediate neighbourhood about the middle of May last, one of them was shot.

" The regularity of the arrival of these ' joyous prophets of the year,' at their breeding places, is truly astonishing. David Falconar, Esq., told me that for the very long period of forty successive years, a pair of them had come to Carlowrie, either upon the 22d or 23d of April. On the forenoon of

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the 23d of April 1837, he asked his gardener if they had made their appearance? "Not yet," he replied. About four o'clock however, in the afternoon, he entered the house, in a great hurry, and with ecstatic delight announced to his master that they had just now alighted upon the top of the stable. They were not seen in 1838 until the 27th of April.

"In one of the bedrooms of my house, on Friday the 28th of July 1837, I made the following observations. At 25 minutes after 4 o'clock in the morning, the old martins began to feed their young ones which were four in number. From that time until 5 o'clock, they fed them four times; from 5 to 6 o'clock eleven times; from 6 to 7 o'clock twenty-four times; from 7 to 8 o'clock fifteen times; from 8 to 9 o'clock twenty-three times; from 9 to 10 o'clock twenty-five times; from 10 to 11 o'clock twenty times; from 11 to 12 o'clock twenty-six times; from 12 to 1 o'clock twenty-six times; from 1 to 2 o'clock twenty-seven times; from 2 to 3 o'clock twenty-eight times; from 3 to 4 o'clock twenty times; from 4 to 5 o'clock twenty times; from 5 to 6 o'clock twenty-seven times; from 6 to 7 o'clock ten times; and from 7 to 8 o'clock only once, making in all 307 times. At 10 minutes after 8 o'clock, having ceased from their labours, they went into their dormitory. They brought to their nestlings at each time, sometimes two, at other times three, four, five, and even more flies of different sizes.

"It was a most beautiful and bright sunny day, and I observed that the female went into her nest five times, and remained about four minutes each time. In a dull and rainy day, the same birds fed their brood only 212 times. The young ones at the time I made those observations were ripe, and the attempts to which the old birds had recourse to induce them to leave the nest were indeed very ingenious. At the distance of about four inches from its orifice, the male held out to them a fly in his bill. In endeavouring to take hold of it, they again and again nearly lost their balance. The female made use of the same stratagem, but it did not succeed, as they were exceedingly cautious. Being therefore unable to prevail upon them to come out by artifice, she was determined to try it by force. She several times got into a passion, and with the claws of her right

foot seized one of them by the lower mandible, while it was gaping in the expectation of receiving food, and used all her efforts to pull it out of the nest, but they were unavailing, as it clung to it like a squirrel. Upon Monday evening the 5th of July 1835, I took out of the nest of a martin, in a window in the town of Bathgate, one of the young birds, which was nearly ripe. I brought it home to try to tame it, but it refused to take food. Being anxious to ascertain how long it could subsist without food, I kept it from 9 o'clock in the evening of Monday until 12 o'clock upon Friday, being three days and fifteen hours. It then appeared lively, but considerably lighter. I then put it into the nest of a Chimney Swallow which was built in my coal-house, where it was carefully fed. This will in some measure account for the wonderful flights which they must take without having the means of procuring subsistence. If the young martins can want food so long, doubtless one would think that the old birds can endure hunger much longer."

Towards the end of September, the House Martins collect into large flocks, which for several days perform long excursions in the neighbourhood of their residence, and are seen settling on the house-tops. At length, in the beginning of October, they disappear, although here and there a few individuals may be seen flying about for some weeks later. Instances of their occurrence even in November are mentioned by several persons, but none are seen after that month. Being at Mr Weir's, near Bathgate, in Linlithgowshire, on the 20th of September 1837, I was told that the Swallows, which had bred in the windows, had disappeared two days before; but we found them in the low grounds about Balbardie House, in the neighbourhood. On the 22d, they had left Edinburgh, although on the 24th I observed some in the sheltered valley of Colinton; and on the 2d of October a few were seen in the neighbourhood.

Young.—The young when fledged differ from the old birds chiefly in having the dark parts of the plumage duller, and tinged with brown.

Genus III. Cotyle.

1. Cotyle riparia. Linn. The Common Sand-Martin.

~~HIRUNDO RIPARIA. THE BANK SWALLOW.~~

SAND MARTIN. SAND SWALLOW. MALLAG.



Fig. 268.

Hirundo riparia. Linn. Syst. Nat. I. 344.
Hirundo riparia. Lath. Ind. Orn. II. 575.
Sand Martin. Mont. Orn. Dict.
Hirondelle de rivage. Hirundo riparia. Temm. Man. d'Orn. I. 429.
Sand Martin. Hirundo riparia. Selb. Illustr. I. 125.
Hirundo riparia. Bank Martin. Jen. Brit. Vert. An. 158.

The upper parts and a broad band across the breast greyish-brown, the lower parts brownish-white; tarsus slightly feathered behind.

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Male.—The ~~Bank Swallow~~ is by much the smallest British family species of this ~~genus~~, and is therefore easily distinguished from the rest, to which it is inferior in beauty of plumage. But, although plain in its appearance, it is elegantly formed, and in agility is certainly not surpassed by any bird whatever. ~~It is proportionally more slender than the preceding species; but~~ I in form resembles the ~~White-rumped Swallow~~, its feet however being bare, excepting a few small feathers on the hind part of the tarsus. The bill is extremely short, depressed, the ridge of the upper mandible rather distinct, its outline convex, as is that of the lower, so that the bill is somewhat stronger than that of the other species. The mouth measures four twelfths of an inch across; the œsophagus is two inches long; House Martin

the stomach seven twelfths in length, and five and a half in breadth; the intestine six and a half inches long.

The nostrils are very small, elliptical; the eyes of moderate size; the aperture of the ear large. The feet are very short; the tarsus a little longer than the hind toe with its claw, bare anteriorly, with seven anterior scutella feathered behind for half-way up; the first toe with six, the second with eight, the third with ten, the fourth with eight scutella; the claws rather long, much compressed, moderately arched, laterally grooved, and tapering to a very acute point, that of the hind toe stronger but rather shorter than that of the third.

The plumage is soft and blended, faintly glossed. The wings are extremely long, with eighteen quills, of which nine are primary, tapering to a rounded point, the first slightly longer than the second; the secondaries, the inner excepted, are emarginate, and the inner four primaries have also a faint notch. The tail is of moderate length, and slightly forked, the lateral feathers exceeding the medial by nearly half an inch.

The bill is black; the iris brown; the feet and claws wood brown. The general colour of the plumage is greyish-brown, the primary quills darker; the throat, hind part of the breast, abdomen, and lower tail-coverts, brownish-white.

Length to end of tail $5\frac{3}{12}$ inches; extent of wings 11; wing from flexure $4\frac{2}{12}$; tail, lateral feathers 2, medial $1\frac{1}{2}$; tarsus $\frac{5}{12}$; first toe $\frac{3}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; second toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{1\frac{1}{2}}{12}$; third toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{3}{12}$; fourth toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{1\frac{1}{2}}{12}$.

Female.—The female is precisely similar; at least I am unable to distinguish her otherwise than by dissection.

Length to end of tail 5 inches; extent of wings 11.

Changes of Plumage.—Like the rest, this species arrives in full plumage. The colour fades much before the period of its departure, the back assuming a bleached appearance.

Variations.—Individuals of a whitish colour are said to occur, but I have never met with any remarkable deviations from the ordinary appearance.

Common Sand-Martin.

Sand-Martin

Habits.—The ~~Bank Swallow~~, which differs essentially in some of its habits from our other species, arrives about the same period as they, and although in one sense more local, is yet more extensively distributed, as it occurs in the most remote parts of Scotland, as well as in the most southern of England, and even frequents the sandbanks on the shores of the northernmost Hebrides, ~~where neither the other Swallows nor the Swift are ever seen~~. Immediately after its arrival, it betakes itself to the stations in which it intends to reside during the season, unless the weather happens to be very severe, in which case it remains for a time in some sheltered hollow, where the insects are most numerous.

Wherever a perpendicular section of diluvium is made, whether by natural causes, or, as is more frequently the case, by artificial excavations, colonies establish themselves, proportionate in numbers to the facilities afforded for lodging themselves, and sheltering their nests. Steep banks of rivers, sand-pits, quarries, and faces made in the soft soil by the action of the sea, are the places in which they are usually found. Sand, gravel, clayey diluvium, or loam, are all adapted for their purpose; and, although instances of their breeding in holes in walls and old buildings are sometimes met with, they are extremely rare. They seldom appear in cities, unless one of their breeding places be in the immediate vicinity; nor do they seek the neighbourhood of man, but prefer the most sequestered spots, on dry heaths or in valleys, although they are not met with in the ravines or glens of our more elevated mountainous districts. It has been alleged that they prefer the vicinity of lakes and streams, and White asserts "that no instance occurs of their abounding but near vast pools or rivers; and, in particular, it has been remarked that they swarm in the banks of the Thames, in some places below London Bridge." But when I consider the places in which I have met with them, as the banks of sea-sand in the island of Harris, a clayey bank on the ~~sea~~ shore near Portobello, various parts of the diluvial banks of the Dee and Spey, the clinkstone quarries of Blackford Hill, various sandstone quarries and sand-pits near Edinburgh, and other localities, I must come to a different conclu-

a diluvial stratum surmounting a quarry, on the sea-shore at Stonehaven,

granite quarries and gravel pits near Aberdeen

sion, and state it to be my opinion that they take up their abode in situations favourable to mining, whether there be water near them or not.

In the face of these banks the little creature commences its operations by clinging with its sharp claws to a selected spot, and digging with its very short and pointed bill, as with a pike. A person ~~One~~ may convince himself that it is a very efficient instrument for the purpose, by employing one of similar form and hardness, for a few minutes, against a section of sand or loam. The circular cavity is gradually deepened, the bird always forming its extremity of a conical or hemispherical shape, and after some progress is made, the debris are ejected with the feet. The hole, which is horizontal, generally extends to a depth of about two feet, and is seldom quite straight, although it makes no abrupt bend, and seems to become sinuous more from accident than design. Frequently deserted holes are found, some just commenced, others in which considerable progress has been made; and it is probable that the cessation has in them been caused by the occurrence of some insuperable obstacle, a stone or bit of hard ground.

The form of the aperture varies according to the nature of the materials of which the bank is composed. When the ground is clayey and tenacious, it is circular; when very loose, and the sand is disposed in thin layers, it is often rectangular. It also, and for the same reason, varies in size, sometimes being not much larger than is necessary for the passage of the bird, and sometimes having a diameter of three or four inches.

The extremity of the hole is wider than the rest, rounded, and scooped out beneath, its diameter about five or six inches. The nest is shallow, forming a small segment of a hollow sphere, and is composed of dry grass, rudely put together, with a lining of a few large feathers. In a specimen found in a sand-pit near Edinburgh I can distinguish Poa trivialis, Festuca duriuscula, Poa pratensis, in long stalks, with their roots, leaves, and panicles, besides a spike of unripened wheat, and a leaf of Potentilla anserina; the feathers those of the domestic duck. The eggs are of an elongated oval form, about eight-twelfths in length, five and a half in breadth, white, without spots, and four or five in number.

Common Sand-Martin

The holes are formed at the top of a quarry merely because that is the only place where the materials are soft enough for the purpose. In a shallow sand-pit I have seen some so low as to be reached by the hand, and a few not at a greater height than four feet. In another pit, they were scattered about the middle, where there was less coarse gravel. Frequently, on the other hand, when bored in the soil, they are within two feet or even less of the surface. Now, certainly, had these birds reason, it would be very thoughtless or foolish in them to deposit their nests so frequently in places where they can be so easily reached by boys and others; but as they have merely the boring instinct, they exercise their propensity without reflection. Multitudes of their nests are destroyed every year by workmen who break down the sides of sand-pits, and boys who dig them out.

as to calamitous consequences

The most injudicious selection of breeding places made by these birds that I know of, is exhibited on the left bank of the river Don, at Kettock's mill, near Seaton House, not far from old Aberdeen. There, the abrupt faces of the bank, annually swept by the floods, are only from two to four feet high, so that to dig out the nest, instead of having to climb one reach up, has to go on his knees. Very few are left any year, and yet the birds have bred there for twelve years, according to my certain knowledge, and probably many more.

The flight of the ~~Bank Swallow~~ Sand Martin is light, graceful, flickering, and rapid. White remarks that it has "a peculiar manner of flying, flitting about with odd jerks and vacillations, not unlike the motions of a butterfly," and doubtless there is some resemblance; but the other species exhibit the same motions, although with more freedom as it were, or on a larger scale. It is to be seen flying about chiefly in the vicinity of its nest, but also over meadows, pools, and rivers, and in all varieties of low situations, in which the insects that form its food abound. I have not found sand or gravel in the stomach of this species, more than in that of the others. Its mouth is equally bedewed with a viscid saliva. Some writers, observing this copious secretion in the mouths of swallows, and seeing the mud crusts of their nests pretty firmly compacted, have alleged that they employ it as a cement. Others have even gone so far as to assert that the Java Swallow forms its esculent nests of this viscous matter. I have failed in discovering traces of glutinous or albuminous matter in the nests of our ~~White-rumped and Red-fronted Swallows~~ Sand Martin and Common Sand-Martin; that of the Sand ~~Swallow~~ Martin can have no pretension to any; and as many birds, such as Goatsuckers and Sylviæ, which do not form concrete nests, have an equally abundant saliva, I cannot but consider the notion as totally unfounded. How many theories, generalizations, and alleged facts, in Natural History, have turned out to be baseless, rash, or inauthentic!

Sand Martinet

But see! there comes a ~~Bank Martin~~, skimming along the surface of the brook, gliding from side to side, deviating by starts, now sweeping over the bank, wheeling across the road, making an excursion over the corn-field, then rising perpendicularly, slanting away down the wind, fluttering among the spikes of the long grass, and shooting off into the midst of a multitude of its fellows. They advance towards us, wheeling and gliding in untraceable mazes. See how beautifully they curve up against the face of the rock; there one has plunged into its hole in the bank,—another—several at once; some come out, and others cling to the pebbly surface. In this very spot an acquaintance of mine once saw a pair of magpies prowling about, and endeavouring to mine out the young from one of the uppermost holes, when the ~~Swallows~~ Martinets, chattering in fierce anger, attacked them in a body, and put them to flight.

— Blackford Hill —

Sparrows sometimes appropriate the nests of ~~the Bank Swallows~~ Sand Martins to themselves, and notwithstanding the pertinacious attacks of the owners and their friends, maintain their conquest. I have seen a colony thus located in a quarry on Blackford Hill, near Edinburgh.

This species is much infested by fleas, with which the nests often swarm.

The young are abroad about the end of June, and the second brood in August. Very large flocks may be seen over lakes and rivers about this season, being attracted by the abundance of insects; but this species does not appear to collect in great numbers, like the others, previous to its departure, which takes place about the middle of September.

The following account of the manner in which the excavations are made by the Bank Swallows, having been sent to me by Mr Robert Dick Duncan, a keen and accurate observer, I have pleasure in presenting to my readers, as he has watched the process more accurately than I have had an opportunity of doing: "The Sand Martins, when they arrive in our district, on the banks of the Almond, in Linlithgowshire, amuse themselves for a few days in skimming the surface of the deep pools, and recognising the places which were their favourite haunts during the preceding year. After these pleasures have been

Common Sand-Martin.

enjoyed for a time, as the season advances, they begin to think of the happiness of domestic life, and to prepare a receptacle for the coming brood. Accordingly, they with us resort to a perpendicular bank of sand, situated on the west of the Almond, and washed by a stream which issues from a sheet of water a little way up the river, and there they repair their old cells, or burrow new ones. It is extremely pleasant to observe the process of burrowing, and it is by no means difficult to enjoy a view of their operations. Taking with me a small telescope or opera-glass, I seated myself at a little distance, on the opposite bank, early on a warm morning in May. The Swallows, noway molested by my presence, continued at intervals to excavate their nests. Grasping the perpendicular surface of the bank with their claws, and steadying themselves by means of their tails, they commenced working by pricking a small hole with their bills. This hole they gradually enlarged by moving round and round, and edging off the sand with the side of their bills, which they kept shut. Their progress at first was slow, but after they had obtained room to stand in the excavation, they proceeded very rapidly, working within with their bills, and carefully pushing out the loosened sand with their feet. At one time the male, at another the female, was the excavator. When their burrowing was impeded by the resistance of a stone or any other obstruction, if unsuccessful in their efforts to remove it, they left the cell and commenced digging a new one. They engaged in these exercises only for a short time each morning, as they abandoned themselves to enjoyment throughout the day. The nests were deposited at the end of the cells, the depth and direction of which varied much. Some extended three feet, others only a sixth of that distance; some were horizontal, some descended nearly perpendicularly for a little, and then rose again; while others turned in many directions. In all, however, the nest was a little elevated above the entrance of the cell. This provision was evidently to facilitate the egress of moisture. The materials of the nest were uniformly a few straws of hay, and many whitish feathers, very carelessly thrown together. The number of eggs which I usually find in each of the nests in this colony on an average, is six. They are small,

of a snow-white colour, tinged with a sulphureous yellow when newly deposited. This tinge disappears when the eggs are dislodged, and arises from the yolk shining through the shell, which is of a very fine thin texture.

" When the females are incubating, their mates sport in the air about the nesting-place, never alighting, as far as I have observed, like the Barn and Window Swallows, and seldom departing to any great distance, but remaining within cry, as if protecting their domiciles from the attack of enemies. I have seen them when a Sparrow-Hawk approached, after uttering a peculiar scream, rush in a body towards the invader, and by menacing attitudes and other gestures of resistance, succeed in driving him from the place. It was in vain he endeavoured to catch one of them, and indeed he seemed aware of this, as he only made the attempt twice, but the Swallows were too quick; and when he might have expected to grasp one in his talons, he found it busy as ever tormenting him from behind. After the young leave the nest, they are fed by the parents on the wing. This feat is performed so suddenly as almost to be imperceptible, and the parents in the act appear as if teaching the young to fly. Being desirous to ascertain the average number of insects destroyed daily by a brood of Swallows, I took my station on a summer morning opposite four young individuals, which were sitting on a ledge of earth, near the abandoned nest, enjoying themselves in the rays of the rising sun. Around them the parents were silently engaged in capturing their little prey, which had been roused into life by the new dawn. The male and female both took part in this exercise, although the latter seemed more attentive, and supplied the young more frequently than the former. One or other carried food to them at least every five minutes. I suppose they were thus engaged for ten hours each day, the case admitting of a calculation of about 6000 noxious insects being destroyed by one small brood in a day. This calculation is perhaps much below reality; but even looking at the subject from this point of view, we find that the destruction of these beautiful birds would be productive of pernicious results. Thus, while the rapidity of its flight enables the Swallow to capture these

insects with facility, nature, ever provident, may have bestowed upon it this property that it may also be better able to elude the movements of its enemies, and thus be spared to preserve the atmosphere, to a certain extent, in a state of purity. These Swallows are not with us, as White says they are at Selborne, "fera natura;" for they both fly in companies and frequent for the most part places within a few yards' distance of houses."

"About the beginning of May 1838," Mr Durham Weir informs me, "a colony of Sand Martins arrived at Balbardie Quarry, in the neighbourhood of Bathgate, where they had reared their young for seven successive years. On the 20th of the same month, I saw them carrying straw and feathers into their holes, of which there were about seventy. They were dug in a stratum of sand, about four or five feet below the surface of the earth, resting upon a bed of gravel, about fifty feet from the bottom of the sandstone rock, which is used in building. To the face of this precipitous bank I have observed them clinging with their sharp claws, and boring with their bills, till they had loosened a portion of the sand, and tumbled it down amongst the rubbish below. When they burrowed further in, they seemed to scrape out with their feet what they had detached by their bills. A number of their holes were circular, whilst others were more irregular in their form, but this might have been occasioned by the sand crumbling away. On the 3d of July, upon the banks of the river Almond, near the village of Livingstone, I examined several of their nests. Some had ripe young ones in them, others only eggs. I found that all the holes were funnel-shaped at the extremity, the widest part being in the middle, and that they were of various depths, some of them being eighteen inches, others two feet, and a few three feet deep.

"Of all our Swallows they seem to be the most social, nestling in numerous communities, and often within a few inches of each other. I have seen them flying in troops from a dozen to forty, in pursuit of insects. During the pairing season the males often fight most resolutely. I am acquainted with a man who has again and again caught them, and separated

them when thus engaged. But notwithstanding their boldness, a curious circumstance with respect to them occurred in June 1835, in Balbardie Quarry. As two of the quarrymen were working, they heard a number of the Martins set up their cry of alarm, apparently much agitated. At first they paid no attention to it, as they thought that it had been occasioned by a hawk, or some other bird of prey. Shortly however after this, they were surprised at seeing a young Martin sprawling at their feet. This attracted their notice, and on looking up they beheld a male sparrow holding by the throat another of the nestlings, which he soon tossed down. To the remaining three he acted in the same cruel manner, and took possession of their abode. During the greater part of a day the parents of the expelled Martins with ten of their friends attempted to dislodge him; but it was to no purpose, as he made a vigorous resistance, and beat them all off. He however suffered for his audacity, for one of the workmen having fixed a piece of wet clay to the end of a long pole, shut him up in the hole, where of course he very soon perished.

"The number of flies which the old Martins carry in their mouths, when feeding their young, is truly astonishing. Out of the mouth of one of those which I shot for Mr Audubon, in July 1838, I took nineteen flies.

"They very soon recognise their enemies, for after I had fired only three or four shots at them, they became so exceedingly shy that they would not, so long as I remained in the neighbourhood, enter their domiciles, even although they had young ones, but kept at a distance. I returned next morning, but had no sooner appeared within sight of the colony, than they set up their cry of alarm and immediately flew away."

Young.—Immediately after exclusion from the egg, the young are flesh-coloured; the region of the eyes, the posterior edge of the wings, a short line across each shoulder, a longer one down the back, and part of the rump, leaden-coloured. They are almost naked, there being only a few very thin tufts of light grey down, one on the forehead, another on the occiput, others on each shoulder, and on the middle of the back.

Common Sand-Martin

When fledged they are as follows. The bill is dusky, its soft basal margins and the mouth yellow; the iris greyish-black; the feet and claws light brown, the soles greyish-white. The upper parts, wings, and tail are greyish-black, the feathers margined with light brownish-red; the primaries and outer secondaries without edging. The throat reddish-white, with small dusky spots; a broad band of blackish-grey across the lower part of the fore-neck, and extending some way down the middle of the breast; the rest of the lower parts pure white. At this age they are much more beautiful than when adult. The specimens from which this description is taken, seven in number, were received from my friend Mr Weir, together with a nest and two eggs, on the 4th July 1837.

The nest I was anxious to obtain, because in my former examinations I had neglected to attend to the alleged glueing of the straws by means of the saliva. I find not the slightest indication of any such workmanship. It is composed of very coarse straws, chiefly of oats, bent in an angular manner, but not interwoven, with some finer stalks and blades of grass in the interior, and a lining of about two dozen of feathers of the domestic fowl and duck.

Genus IIII. Progne.

1. Progne purpurea.

After which Family II. Tyrranina, p. 512.

after p. 552.

Family I. CYPSELINÆ. Cypseline Birds.

~~SWIFTS AND ALLIED SPECIES.~~

Almost all authors have included the Swifts in the same family, and many in the same genus, as the Swallows. The similarity of their mode of flying, their kind of food, and the manner in which they obtain it, together with an obvious resemblance in the form of the bill and wings, have caused this association, which however appears to me to be too intimate, for these birds differ in several respects fully as much as many families which are widely separated from each other. Their distinctive characters will readily be perceived on comparing the following generic description with that of the Hirundinæ.

The body is moderately full, somewhat elongated, and rather depressed; the neck very short; the head roundish and flattened. The bill extremely short, weak, depressed, opening to beneath the hind part of the eyes, compressed at the end, the upper mandible with the dorsal outline convex, the ridge rather narrow, the edges inflected toward the end, the tip declinate, lower mandible much smaller, with the angle very large, the dorsal line extremely short and slightly convex, the edges a little inflected toward the end, the tip slender.

Palate nearly flat, covered wih minute papillæ, and having two faint elevated lines; both mandibles slightly concave, with a median prominent line. Tongue short, triangular, fleshy, sagittate and finely papillate at the base, horny beneath, and obtuse or somewhat bifid at the tip. In the space between the crura of the lower jaw are two large masses of salivary crypts arranged in series. Œsophagus wide above, of moderate length in the rest of its extent, without crop; stomach elliptical, its muscular coat of moderate thickness; the epithelium dense, and

longitudinally rugous. Intestine extremely short, rather wide; no cœca; rectum enlarged into an ovate cloaca. No inferior laryngeal muscles. Plate XXII, Fig. 5.

Nasal sinus large; nostrils basal, oblong, approximate. Eyes large; aperture of ear rather large. Feet extremely short; tarsus stoutish, feathered or bare; four toes, all directed forwards, and having the same number of phalanges, namely two, or at least having the basal phalanges abbreviated; the first toe smallest, the third little longer than the second and fourth, which are nearly equal; claws rather large, stout, decurved, very acute.

The plumage is rather compact above, blended beneath, moderately full. No bristles about the mouth. The wings are extremely elongated, falciform; the quills about eighteen; the secondaries very short, the first or second primary longest. Tail of ten feathers, of moderate length, or long, but much exceeded by the wings.

These birds are remarkable for the extreme rapidity of their flight, and their unwearied activity, in which respects they excel even the Swallows. Feeding exclusively on insects, which they seize in open field, they migrate from the warmer regions in which they have passed the winter, advancing northward as the temperature increases, and, remaining for a shorter period than almost any other migratory bird, return long before the swallows. They place their nests in holes and crevices of buildings and rocks, or attach them to elevated places, laying from two to five very elongated white eggs, are generally of a social disposition, and are noted for their loud, shrill, and joyous cries, but have no song or modulated notes, their inferior larynx being destitute of the muscles observed in birds which have a varied voice. Their digestive organs differ from those of the Swallows in having no cœca; but in the form of the mouth and bill they approach nearer to the Goatsuckers, whose digestive organs more resemble those of the Owls and Cuckoos. In the Swifts, as in the Swallows, the bones of the wing are extremely short, especially the humerus; but the sternal apparatus differs, its crest being extremely elevated anteriorly, and its posterior margin even, in the former, Fig. 269,

whereas in the latter the crest is less raised, and the posterior margin deeply notched, as in the Cantatores and Excursores, in which the skeleton is otherwise very similar. Indeed the affinities of these birds are very complex; but for the present occasion it will suffice to shew that in the British series, the Cypselinæ are intermediate between the Hirundinæ and Caprimulginæ.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. CYPSELUS. SWIFT.

Bill very small, weak, opening to beneath the hind part of the eye, much compressed at the end; gape-line arched; nostrils oblong, marginate; wings extremely long, falciform; tail of ten feathers, emarginate or forked; tarsus very short, feathered; all the toes directed forwards, and having only two phalanges, three of them nearly equal; claws stout, decurved, acute.

1. *Cypselus ~~Melba~~.* *White-bellied Swift.* Greyish-brown, with the throat, breast, and abdomen, white.

2. *Cypselus ~~murarius~~.* ~~*Black*~~ *Swift.* Brownish-black, with the throat whitish.

Genus II. Acanthylis.

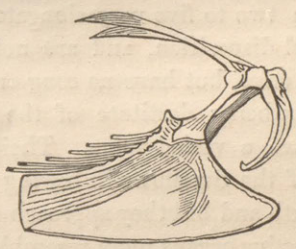


Fig. 269.

Illig.

Genus I. CYPSELUS. SWIFT.

Bill extremely short, depressed, broad at the base, narrowed to the point, so as to present a triangular form when viewed from above; upper mandible slightly longer, its dorsal outline convex, the ridge convex, the sides sloping at the base, convex at the end, the edges sharp and incurved, the nasal sinus very large; lower mandible much smaller, very broad, its angle very large and wide, the dorsal outline convex, the edges involute, the tip narrow but obtuse; gape line commencing nearly beneath the posterior angle of the eye, ascending to near the nostrils, then slightly arched.

The mouth very wide; the upper mandible shallow, with a slight prominent central line, the lower also shallow, with a similar line; the palate flat, but slightly arched, with two faint lateral lines; the posterior aperture of the nares linear, papillate behind, and having its lateral spaces also covered with small papillæ. Tongue short, sagittate, papillate at the base, its tip bifid. The œsophagus is rather narrow, wide at the commencement; the proventriculus oblong, with short glandules. The stomach is elliptical, somewhat compressed; its muscular coat rather thin, its tendons moderate, its cuticular coat thin, tough, and longitudinally rugous. The intestine is very short; the duodenal portion much wider than the rest, excepting the rectum, which gradually dilates to a very large pyriform sac; no cœca. Plate XXII, Fig. 5.

The nostrils are prominent, oblong, with an elevated margin, oblique, in the fore part of the large nasal membrane, which is feathered behind. The eyes are rather large; the eyelids bare, but with two submarginal rows of feathers, the bare edges crenate. External aperture of the ear large and roundish.

The general form is rather full; the body of an elongated flattened shape; the neck very short, the head broad. The feet are extremely short, but strong, and more resemble those

of a quadruped, than the feet of any other bird; the tarsus extremely short, feathered anteriorly, bare behind. The pollex or inner toe smallest, the third largest, the second next; the first toe not directed backwards, but forwards and inwards, so that it cannot be put in opposition to the rest, collectively, although it may to the fourth or outer. Another very remarkable circumstance is that the toes have all the same number of articulations, namely two, and are very short; they have a few scutella above, and are obscurely papillate beneath. Claws large, strong, tapering, curved, very acute, moderately compressed, convex above, flattish beneath.

Plumage soft, rather blended, glossy, the feathers oblong, with a rather tufty moderate plumule. There are no bristle-feathers at the base of the bill. Wings extremely long, narrow, and pointed; the quills and coverts with exceedingly strong, elastic shafts; the quills eighteen, the secondaries very short and rounded, the primaries ten, tapering to a rounded point, the outer a little incurvate towards the end, so as to render the wing falciform. Tail long, but much exceeded by the wings, deeply forked, of ten tapering feathers having strong shafts, the outer slightly recurved.

The Swifts ~~differ from the Swallows chiefly in having their feet stronger, although shorter, and their toes different in form and disposition, with stronger~~ are remarkable for having short strong toes and curved acute claws all so directed that the bird can cling very securely even to a perpendicular surface. Owing to the extreme shortness of their feet, they are unable to walk, unless with a most constrained and hobbling gait, with the aid of their wings, the extreme length of which combined with the form of the feet, prevent them from rising from a flat horizontal surface, so that they never settle on the ground, but alight only on such places as present a brink or declivity from the edge of which they can launch forth in a curve. Their flight is extremely rapid, and on wing they perform the most aburpt turns and the most varied evolutions, with the greatest ease. They nestle in holes in buildings, or in crevices of rocks, forming their nest of materials gathered on wing.

Only two species occur in Europe, of which one is generally distributed in Britain. Two or three individuals of the other have been killed in England.

Linn.

1. CYPSELUS MELBA. THE WHITE-BELLIED SWIFT.



Fig. 270.

Hirundo Melba. Linn. Syst. Nat. I. 345.
Hirundo major hispanica. Briss. Av. II. 504.
Hirundo Melba. Lath. Ind. Orn. II. 582.
Martinet a ventre blanc. Cypselus alpinus. Temm. Man. d'Orn. I. 433.
Alpine Swift. Cypselus alpinus. Selb. Illustr. I. 127.
Cypselus alpinus. Alpine Swift. Jen. Brit. Vert. An. 159.

All the upper parts, together with the sides and lower part of the neck, the sides of the body, legs, and lower wing and tail-coverts, greyish-brown; the rest white; length to end of tail about nine inches.

Male.—In form and proportions the White-bellied Swift resembles the common species, having the body moderately stout, the neck short, the head rather large and depressed; the bill somewhat more slender and elongated, its upper outline considerably curved; the nostrils linear-oblong, marginate, a twelfth and a half in length. The tarsus is very short, rather stout, and feathered; the first toe much smaller than the rest; the second and fourth about equal, the third a little longer; all bare, with a soft skin, on which are merely indications of scutella,

there being five on all, except the third, which has seven. The claws are remarkably stout, well curved, much compressed, concave beneath, very acute.

The plumage is slightly glossed, and somewhat compact; the feathers ovato-oblong. The wings are extremely long and narrow, extending nearly two inches beyond the tail; the second quill a quarter of an inch longer than the first; the secondaries extremely short, and only eight in number. The tail is rather short, deeply emarginate, the lateral feathers nearly an inch longer than those in the middle.

The bill is black; the iris hazel; the toes dusky flesh-colour, the claws dusky, with the tips pale. The general colour of the plumage is greyish-brown, the quills of a darker tint, their shafts greyish-black. There is a large patch of white on the throat, and the breast and abdomen are of that colour; the rest of the lower parts, namely the sides and lower fore-part of the neck, the sides of the body under the wings, the lower wing-coverts, tarsal feathers, and lower tail-coverts, of the same tint as the back. Most of the brown feathers, especially those on the lower parts, are terminally edged with paler.

Length to end of tail 9 inches, to end of wings $10\frac{1}{12}$; extent of wings estimated at 21; wing from flexure $9\frac{1}{12}$; tail $3\frac{1}{12}$; bill along the ridge $\frac{4\frac{3}{4}}{12}$, along the edge of lower mandible $1\frac{4}{12}$; tarsus $\frac{6\frac{1}{2}}{12}$; first toe $\frac{5}{12}$, its claw $\frac{4\frac{1}{4}}{12}$; second toe $\frac{4\frac{1}{2}}{12}$ its claw $\frac{5}{12}$; third toe $\frac{5}{12}$, its claw $\frac{5\frac{1}{4}}{12}$; fourth toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{4\frac{3}{4}}{12}$.

Female.—The female is similar to the male.

Habits.—This species, which is easily distinguished from the other, by its superior size, and the white so conspicious on its lower parts, appears to rank no higher with us than as a rare and accidental straggler, although it has been conjectured that it may breed on the southern coast of Ireland. An individual is recorded to have been shot in the Isle of Thanet, in June 1820; another near Buckenham Church in Norfolk, in September 1831; and a third was found dead near Saffron Walden in Essex, in July 1838. A specimen was also ob-

tained, in March 1833, at Rathfarnham in Ireland. Mr Harley, of Leicester, informs me that between five and six o'clock of the evening of the 23d September 1839, he saw an individual of this species, which he says he could not possibly have mistaken. "The stretch of the wings having been much too great for the common Swift, probably not less than eighteen or twenty inches. The throat, breast, and belly, down as low as the vent, appeared white. The evening was serene, and the bird was gliding gently along, at the height of fifteen or twenty yards. Its motion in passing overhead was just like the shoot of the Windhover through the air."

About the middle of spring, the White-bellied Swift passes from Africa to the European countries bordering on the Mediterranean, many individuals proceeding as far as the Tyrol, Switzerland, and the parts of France adjoining the Alps. M. Temminck states that it is very abundant at Gibraltar, in Sardinia, Malta, and the islands of the Archipelago. Its places of repose are precipices and the most elevated parts of buildings, in the crevices and against the walls of which it fixes its nest, which is formed of straws and moss kept together by some glutinous substance. The eggs, three or four in number, are white, and of an elongated form.

Young.—When fledged, the young are similar to the adult, but with all the dark feathers on the upper parts margined with paler, and those on the lower having a semilunar terminal white band.

Remarks.—Not having seen this species alive, or obtained recent individuals, I have taken my descriptions from preserved skins.

2. CYPSELUS ~~MURARIUS~~ apus. Linn. Common. THE ~~BLACK~~ SWIFT.

BLACK MARTIN. SWIFT. SCREECH. DEVELING.

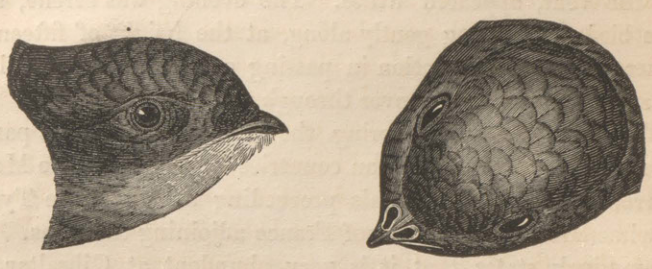


FIG. 271.

Hirundo Apus. Linn. Syst. Nat. I. 344.
Hirundo Apus. Lath. Ind. Orn. I. 582.
Swift. Mont. Orn. Dict.
Cypselus murarius. Temm. Man. d'Orn. I. 434.
Common Swift. Cypselus murarius. Selb. Illustr. I. 127.
Cypselus Apus. Common Swift. Jen. Brit. Vert. An. 159.

Blackish-brown, slightly glossed with green, the throat greyish-white.

MALE.—The form of the Swift is admirably adapted to its mode of life, but not more so than that of any other bird, although we are enabled to trace the connection between its form and habits in a comparatively satisfactory manner, both being so remarkable as to render the task easy. The body is of a somewhat elongated and flattened shape, anteriorly broad, with the pectoral muscles large; the neck very short, the head broad, the wings excessively long and narrow, the tail rather long and deeply forked, the feet very short, but strong, the bill very small, the mouth very wide.

Both mandibles are deflected, and taper rapidly to a narrow

blunt point. The mouth opens nearly as far back as the posterior edge of the eye, and measures eight and a half twelfths across. The tongue is very small, three-twelfths of an inch long, triangular, with the apex slit? The salivary glandules, Plate XXII, Fig. 5, *l l*, are aggregated into two large masses, placed under the tongue, and the mouth is copiously supplied with a viscid secretion. The œsophagus, *b c d*, is two inches and seven-twelfths long, narrow, of uniform width; the proventriculus, *c d*, with very short glandules. The stomach, *d e*, is ten-twelfths long, or when dilated an inch and nine-twelfths broad, elliptical, compressed; its muscular coat rather thin, of rather large fibres; its tendons of moderate size; the cuticular lining rather thin, tough, and rugous. Pylorus small, without valve, entered by the cuticular coat of the stomach. Intestine, *d e f k*, seven inches and a quarter long; its duodenal portion, *f g h*, three-twelfths in diameter, the rest contracting to a twelfth and a half; but the rectum rapidly enlarged to a pyriform sac, *j k*, half an inch in diameter. There are no cœca.

The eyes are rather large and prominent, their aperture two-twelfths in diameter; that of the ears three-twelfths. The feet are extremely short, but very strong; the tarsus feathered anteriorly; the toes very short, differing little in length, but the third largest, the second next, and the first or inner smallest; the latter is directed inwards and forwards, but cannot be turned directly backwards; they all have only two phalanges. The claws are very strong, curved, acute.

The plumage is soft, slightly glossed, moderately compact. There are no mandibular bristles. The eyelids are bare, but ciliated with short, tufty, feathers. The wings, which extend about an inch and a half beyond the tips of the tail, are falciform, being incurved towards the end; the quills eighteen; the secondaries and their coverts very short, and rounded; the primaries and their coverts excessively long, with very strong shafts; the second quill is a little longer than the first, when the wing is closed, but the latter is slightly longer when the wing is extended; the third is a good deal shorter, and the other primaries rapidly diminish. The tail is long, and much

forked, the lateral feathers an inch and a quarter longer than the medial, and a little recurved.

The bill, feet, and eyes are black. The general colour of the plumage is blackish-brown, generally glossed with slight greenish reflections; the throat whitish; the outer primaries darker than the rest.

Length to end of lateral tail-feathers $7\frac{1}{2}$ inches; extent of wings $16\frac{1}{2}$; wing from flexure 7; tail $3\frac{1}{2}$, the middle feathers 2; bill along the ridge $\frac{1}{4}$, along the edge of lower mandible $\frac{10}{12}$; tarsus $\frac{5\frac{3}{4}}{12}$; first toe $\frac{2}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; second toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{3}{12}$; third toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; fourth toe $\frac{2\frac{3}{4}}{12}$, its claw $\frac{5}{12}$.

Female.—The female is a little lighter above, and has the feathers of the lower parts slightly margined with a paler tint, the throat whiter, its feathers dusky on the shafts.

Length to end of tail $7\frac{4}{12}$ inches; extent of wings $15\frac{1}{2}$, wing from flexure $6\frac{3}{4}$; tail $3\frac{1}{4}$; bill along the ridge $\frac{2\frac{1}{2}}{12}$, along the edge of lower mandible $\frac{9}{12}$.

Variations.—In adult individuals, the variations are not remarkable.

Changes of Plumage.—This species arrives in Britain in perfect plumage. The colours fade considerably as the summer advances, becoming of a browner tint, and by the middle of August the plumage has acquired a bleached appearance.

Habits.—The Black Swift arrives in the south of Scotland in the beginning of May. Mr Selby says that "it is seldom seen in the northern parts of England before the end of May or the beginning of June;" but this appears to be a mistake, for in Edinburgh it always comes before the tenth of May, and even in the very severe weather of 1837 it was seen at Canonmills by my son on the 1st, and at Newington by myself on the 3d of May. In the south of England it is stated to appear between the 20th of April and the 1st of May; and Mr Har-

ley informs me that in Leicestershire it usually makes its appearance before the 8th of that month. It is not in general, however, until after the different species of Swallow have been seen that it makes its appearance, a few individuals only presenting themselves at first, and the number gradually increasing, until at length they become in many places plentiful, and attract attention by their extremely rapid flight and loud screams.

It betakes itself to steeples, high towers, ruinous castles, and abrupt rocks, where it nestles in the holes and crevices. At early dawn, in fine weather, it is to be seen shooting through the air in all directions, with a rapidity scarcely equalled by that of any other bird. Its flight is performed by quick flaps of its long narrow wings, alternating with long glidings or sailings, during which these organs seem motionless, but extended nearly at a right angle. If you watch an individual, you observe it speeding away with quick motions of the wings, which being raised and depressed over a great range, seem to alternate with each other; but this is not in reality the case, at least, I have failed in satisfying myself that it is so. There, it shoots along on motionless wings, turns to the right and left, flutters for a moment, ascends, comes down abruptly, curves, and winds in various directions, darts in among its fellows, and is lost to your view. The ease with which it rises, falls, bends to either side, glides in short or long curves, or stops in the midst of its full career, is less astonishing than it ought to be, familiarity in this, as in other instances, producing a disposition to regard as simple what is the result of elaborate mechanism.

It continues searching the air in this manner during the whole day, when the weather is good; nor does a shower, however heavy, usually induce it to relinquish its pursuit. Even in the midst of heavy thunder rains, it may often be seen wheeling and diving with unremitting vigour; and in drizzly weather, when the Swallows have disappeared, it pursues its avocations, heedless of the damps. On the day on which the accession of her Majesty was proclaimed in Edinburgh, the weather was extremely sultry and oppressive, and a very heavy rain fell in the afternoon, during which I was a little surprised

to see the Swifts wheeling joyously over the town at a considerable height. How the insects, of which ~~of course~~ they were in pursuit, could exist in such a rain is not less astonishing. In dry and sunny weather, however, it generally rests in the middle of the day, and towards evening is extremely active, filling the air with its shrill and joyous screams.

Its food consists entirely of insects, which it seizes exclusively on wing. Several curious circumstances may be noted with reference to its pursuit of these animals. In rainy or damp coldish weather, the Swifts are to be found flying at no great height, generally from ten to fifty or sixty yards, frequently in bands of twenty or more, often shooting along the sides of the hedges, descending in curves, and skimming the surface of the grass, wheeling and circling, now and then turning abruptly on spying an insect out of their course, and performing all sorts of evolutions, scarcely describable, however, at least with a rapidity calculated to impress an idea of that which they exhibit. On such occasions they are easily shot, for they often come quite close to the gunner, being altogether heedless of his presence, so intent are they on capturing their prey.

In fine weather, they fly low in the mornings and evenings, and are among the first birds that come abroad, and the latest that retire to their places of repose ; but during the greater part of the day they are to be seen chiefly at a great elevation, apparently that of several hundred yards. Yet I have seen them flying high in rainy weather, when the clouds were separated by long intervals ; and, from long observation, I am satisfied that no prognostication of the weather can be based on the flight of Swifts and Swallows. These birds fly high or low, according as their prey is abundant in the higher parts of the air, or near the surface of the ground or woods ; and as insects fly lower in the evening and morning, or in damp weather, so the Swifts then descend.

In dry sunny weather, they frequently utter a long, loud, shrill scream, as they pursue their prey ; but not in such weather alone, for you often hear it before or during rain, especially in the evening. Some have fancied this scream to be an intimation given by the male to his mate that he is at hand, and

others that it is caused by the excitement of electricity; but these conjectures are destitute alike of ingenuity and truth. It is not in thundery weather alone that Swifts scream, but often in the clear, dry, and sunny skies, that exhibit no phenomena indicative of a want of electric equilibrium. And as to the other theory, it suffices to reflect that Swifts scream as frequently over the open fields at the distance of a mile or more from their nesting places, as when wheeling near steeples or towers. The cry of the jackals and hounds when in full chase seems to be analogous to the scream of Swifts under similar circumstances; but the cause and use of either is not satisfactorily ascertained. I have observed however that single birds very seldom scream, and that the loudest and most frequent cries are heard when birds are evidently in active and successful pursuit. It is so with Terns, Gulls, and even Gannets; and when you see these birds hovering over the sea, and hear their mingling cries, you may be sure that they have discovered a shoal of fishes, and are enjoying their good fortune. They seem to scream or cry out from pleasure, and thus give intimation to their fellows of the plentiful existence of food. As to the organ of this loud and shrill scream in the Swift, namely, the trachea, it is short, remarkably flattened, gradually diminishes in diameter to the bifurcation, and is destitute of inferior laryngeal muscles. It has no song, or twitter, like the Swallows.

Now, having described the organization and habits of this bird, I may offer some explanations as to the action of the former. If we suppose that the Swift is destined to feed exclusively on insects as they flutter in the air, we can be at no loss to trace the reason of its peculiar form. Its body is light, but moderately stout, and its pectoral muscles are large, otherwise it could not move its wings with the necessary strength and rapidity. The wings are extremely elongated and narrow, because great rapidity of flight is required in the pursuit of animals which themselves fly with speed, and because sudden turns require to be executed in seizing them. A short, broad, concave wing, as that of a Partridge, on being rapidly moved produces considerable rapidity, but is not fitted for either buoyant

gliding or quick evolution. For the latter the surface of the wing must be extended in length and narrowed, and instead of presenting a concavity must be straight in the horizontal direction. Accordingly in the Swift the wing has its humeral articulation peculiarly free, insomuch that holding one alive in your hand you at first imagine that its wings have been broken. At the same time, their muscular apparatus is remarkably strong. Then the secondary quills are very short, and the primaries gradually and rapidly elongated, and furnished with very strong but highly elastic shafts. The tail, although not so long, is similarly constructed, being deeply forked, and so in a manner divided into two pointed and elongated laminæ similar in some degree to the wings, and aiding their action in executing turns. In seizing its prey, while gliding or fluttering in the air, the bird would be incommoded by any length of neck; that part is therefore extremely abbreviated, so that the head seems as if stuck upon the shoulders, as is the case, for a similar reason, in the Cetacea and fishes. A long pointed bill would be of use only to a bird that has objects to pick from the ground or any other surface, or from among soil or foliage. In the present case, the bird, carried with rapidity to its tiny prey, merely requires to open its mouth, which is extremely enlarged, and supplied with an abundant viscid secretion, which immediately entangles the fly that has been caught, and prevents its escape should the mouth be opened the next instant. A bird so living has no need of walking, and there being nothing superfluous in nature, its feet are reduced to cramping organs, by which it can cling to any kind of surface when entering its nest, and its gait is merely a hobbling motion, aided by the wings. It cannot rise from a flat surface, as I have ascertained by experiment, but it launches from any little eminence, and if it can spring out horizontally, is enabled to fly off, although its usual mode of launching is like that of the Gannet by a deep curve.

These two birds are very similar in some points of their organization. Their wings are long and narrow, and their flight is rapid and buoyant; they seize their prey by throwing themselves with velocity upon it; they launch from the rocks

in the same manner, and exhibit other points of mutual resemblance; as do the Terns more especially, which, on account of their form and buoyant flight, have received the vulgar appellation of Sea Swallows.

The want of walking feet might be supposed to be somewhat inconvenient on many occasions. Thus, when the bird has its nest to make, it must gather straws and feathers. But so great is its dexterity on wing that it picks them up with ease as it skims along. The nest is placed in the crevice of a wall or rock, in a steeple or tower, in holes under the eaves, or in some such place, at as great a height as possible, and is composed of twigs, straws, and feathers, being bulky, but shallow, and not neatly arranged. The eggs are two or three, of an elongated form, pure white, their average length one inch, their greatest breadth seven and a half twelfths. They are deposited from the beginning to the middle of June, and the young are abroad by the end of July. Only one brood is reared in the season. The Swifts take their departure from the middle to the end of August, thus residing with us only about three months and a half.

As the insects on which they live are generally very small, they do not swallow each as it is caught, but collect a number previous to the act of deglutition, for at whatever period they are shot, one generally finds insects in their mouths. When collecting food for their young, they do not return to the nest so frequently as the Swallows, but accumulate a considerable quantity at a time. I have never found any particles of gravel or sand in their gizzards, of which the hard cuticular lining is of a reddish-brown colour, as in most birds that feed on insects, such as Wagtails, Pipits, and Warblers. The insects on which they feed are various species of Coleoptera, Ephemeræ, Phryganeæ, and occasionally Libellulæ and Muscæ.

~~White seems to be the first who observed that Swifts copulate on wing.~~ "If any person," ~~he~~ White says, "would watch these birds of a fine morning in May, as they are sailing round at a great height from the ground, he would see every now and then, one drop on the back of another, and both of them sink down together for many fathoms with a loud piercing shriek.

This I take to be the juncture when the business of generation is carrying on." Such phenomena certainly present themselves, yet it is not by any means improbable that they are merely indicative of the hostility of rival males; for we often see larks fighting in the air, and so keenly engaged that they sometimes descend "many fathoms" before separating; and I have observed eagles struggling on wing, and emitting "a loud piercing shriek," although no one could reasonably suppose them to be then copulating. Swallows when feeding their young on wing, might be supposed otherwise occupied; for the two birds flutter, and descend, in the same manner.

In the longest days of June, the Swift comes abroad as early as half-past two, and I have seen it flying as late as half-past nine. In the summer of 1837, I made some observations on its mode of flight, which I here transfer from my note-book, they having always been written down on the spot.

There, on this beautiful evening of the 1st of July, when the whole sky is cloudless, but overspread with a filmy haze, through which the setting sun displays his broad red disk, the Swifts come screaming in troops over the house-tops. They fly so rapidly that you can scarcely suppose them to be searching for prey; yet now and then a sudden turn indicates the capture of a fly. When they separate, they cease from their noise, and for a while speed along in curves rapidly moving their wings; but now three or four sweep past in succession, as if one had in view to overtake or outstrip another, and their shrill cries form a continuous scream. Another band dashes into the line, and they mingle together for a moment, then separate, and fly off solitarily. Their cries, shrill and somewhat harsh as they are, seem cries of joy, for they are loudest and most frequent when they fly close together; and certainly they are not indicative of animosity, for Swifts on such occasions never fight or attempt to injure each other. Again they shoot past; but by this time we have enough of them. In half an hour, they will have retired to their holes, and when our own flight of life is over, we shall follow their example. Now, if electricity be the exciting cause of all this screaming, let us take note of the weather, and see if it will lead us to any result.

On the 2d July, the sun shone brightly till about eleven, when the sky became overcast with a thin blue stratus, the

weather was oppressively hot, the atmosphere perfectly stagnant, and I judged it possible that there might be thunder before night. The Swifts flew at a moderate height, in perfect silence, and appeared busily occupied, neither mingling in groups, nor chasing each other. About six in the evening, having seated myself on a rock on Blackford Hill, I watched about a dozen flying at about the same height over the little valley. They retained the same silence which they had kept all day, flew rather more slowly than usual, and never chased or interfered with each other. The Bank Swallows had retired to their holes, a very few Larks and Corn Buntings were heard singing; but the birds in general were unusually silent. The Swifts now and then came so close to me, that I could perceive with certainty that their mouths were not open, and trace all their motions in a satisfactory manner. They keep the head quite retracted, and rather below the level of the back; the wings are never fully extended, unless during some sudden turns; but when the bird is gliding along, the two wings appear to form a curve of about the third of a circle; the tail is very slightly spread so that the fork is just perceptible, but, during deflection in a vertical direction is spread out and depressed or elevated. On returning home, I found the Swifts flying low over the houses, much in the same style, but occasionally emitting a scream, which had not however the usual joyous expression. The dark haze hung over the sky, but, although the air had an electric feeling, and there was not a breath of air, no thunder was heard, and no rain fell. The weather continued the same until eight next morning, when a slight breeze sprung up, a smart shower of very heavy drops fell, and by ten the sky was clear, with thin cirrocumuli, and a light wind. In the evening the Swifts flew more joyously, screaming and chasing each other. The heat was then much less oppressive, for there was a good breeze, and a clear sky.

On the fourth day, the weather was close and sultry. The Swifts were silent. At five rain fell, and continued until night. For an hour or so, no Swifts were seen, but in the evening they were flying just over the houses, in the midst of the rain, dashing along, and screaming, in their most joyous mood.

Now, the inferences from these facts are: that close, dull, electrical weather, instead of exciting, depresses Swifts and other birds, and renders them dull and silent; that from the flight of these birds, considered as to its elevation, no indication of the coming weather can be formed; for on the fine hazy evening, the suffocating, dull, electrical evening, the moderately cool dull evening, and the rainy and refreshing evening, they flew much about the same height.

Until the 12th day of July, the weather continued clear and excessively warm, and the Swifts flew in their usual manner, at a low or moderate elevation, occasionally screaming and mingling with each other. On that day, the wind having become easterly, and the upper current moving in an opposite direction, the sky became overcast, and in the evening some showers fell, and a little thunder was heard. Yet the Swifts flew in the same manner, although they were more silent than usual. On the 13th it rained a good deal, yet they flew about, screaming, in the midst of the showers; but at four o'clock a tremendous flood poured down and seemed to send all the birds to places of shelter; although immediately after, the Swallows were seen. In the evening the Swifts flew as usual, generally low, and occasionally screaming. On the 14th, the clouds mustered about nine in battle array, and in about half an hour commenced a thunder-storm which lasted until near twelve. The rain fell incessantly, and at times in torrents, yet the Swallows and Swifts kept flying about at the usual height or rather higher, all the time, and so continued all day, without any alteration in their manner. The rain continued at intervals until night. All nature seemed refreshed; the birds were cheerful, and chirped more than usual, and I could perceive a decided alteration in the men and women in the streets, who instead of walking languidly as in hot dry weather, moved with uncommon vivacity. So is it always during or immediately after rain, which is one of our greatest blessings at all seasons, however much it may be blamed by foolish and inconsiderate people.

By the middle of August the Swifts are all gone, and to him who attends to the habits of birds their absence produces

at first a disagreeable feeling, like the regret at the absence of a familiar friend. The Swallows too become scarcer in the cities, for at this season, most of those whose young are abroad betake themselves all day to the fields, where they find an abundant supply of insect food.

" In June 1836," Mr Weir writes, " being very anxious to examine some Swifts' nests, I with great difficulty procured two of them from the top of the old quire of Torphichen. They were formed of feathers, straw, grass, and other materials. The inside of them appeared to be firmly cemented together with what seemed to me the resin of the Scotch Fir, thickly intermixed with the membranous scales of the terminal branch buds.

" In the ancient town of Lauder a great number of Swifts annually build. On the 1st day of August 1839, under the thatch of one of the houses, in the space of twenty-five feet, I examined no less than nine of their nests. They were composed of almost the same materials, and cemented with the same composition as those which I had formerly obtained. Each of them contained two young ones fully fledged. When feeding them the parents usually fixed themselves against the face of the wall by means of their strong toes and hooked claws. They had a great number of flies in their mouths, as I observed some of them take three minutes and a half, others four minutes in feeding their brood."

Two of these nests, brought to me by Mr Weir for the purpose, I have minutely examined. One of them more perfect than the other, may be thus described. It is very rudely constructed, flattened, about six inches in diameter, and half an inch thick; composed of panicles of Aira cœspitosa, straws of oats, wheat, and grasses, intermixed with fibrous roots, moss, wool, cotton, hair, and feathers of the domestic fowl, partridge and rook. These materials are confusedly felted, and agglutinated; the glueing matter being of a gelatinous, not of a resinous nature, and in extremely thin shreds, which crackle, but do not readily burn, when flame is applied to them. There is however a small quantity of the membranous

scales of the Scotch Fir, together with some resinous matter in one of these nests.

In another nest sent to me by Mr Weir, the external parts are similarly constructed, the feathers in the interior are agglutinated in the same manner, and there are numerous bud-scales of the fir, to which a little resinous matter adheres. But I am convinced that the principal part of the agglutinating substance does not consist of resin, but of gelatinous matter, which may probably enough be derived from the salivary glands, Plate XXII, Fig. 5, *ll*, which are aggregated crypts, secreting a fluid similar to that of the proventricular glands.

Young.—The young are of a dusky colour, at first blind, and almost naked, having merely a few straggling tufts of down. When fully fledged, they are of the same colour as the adults, but of a lighter tint, with the edges of the feathers of the head paler. They do not moult previous to their departure.



Fig. 272.

Genus II. Acanthylis -

then top. 105. Cuculinæ.

From p. 140.

Family III. CAPRIMULGINÆ. Caprimulgine Birds.

GOATSUCKERS AND ALLIED SPECIES.

Birds of this family are as readily recognised as those constituting the Falconinæ, Striginæ, Hirundinæ, or any other of the most strictly natural families, so that there is not much necessity for entering here upon copious illustrative details, especially as in Britain there is only a single representative of it. The following appear to be the most important general characters.

The body is very small in proportion to the plumage; the neck rather short; the head very large, broad and depressed. The nostrils elliptical, prominent and marginate; the eyes extremely large, the eyelids ciliated with slender barbate plumelets; the aperture of the ear of great size, and resembling that of many Owls. The mouth opens to beneath the centre of the eyes, and is of extreme width. The bill is very short, much depressed, generally feeble, the horny part being small, but in some large and very strong; the upper mandible with the dorsal outline convex, the ridge rather narrow, the edges inflected toward the end, the tip very narrow and deflected; the lower mandible smaller, with the angle extremely large, the crura slender, the edges inflected toward the end, the tip small and deflected.

Palate nearly flat behind, concave, covered with a smooth transparent membrane. Tongue extremely small, slender, tapering to an obtuse point. Œsophagus wide, without crop, very thin; stomach large, roundish; its muscular coat very thin, and composed of a single series of fasciculi; the epithelium very hard, with prominent longitudinal rugæ. Intestine short, wide, and extremely thin; cœca large, oblong toward the end, narrow at the base; cloaca globular. Trachea of nearly uniform width, and destitute of inferior laryngeal muscles.

The feet are very small; the tarsus partially feathered; the toes four, with their lower surface broad and flattened; the anterior toes connected by basal membranes; the first toe shortest and directed inwards, the second next, the third much longer than the fourth. Claws moderate, well arched, compressed, acute.

The plumage is full, very soft, blended; the feathers ovate or oblong. Wings very long, with the second and third quills longest. The tail long, rounded, even, or forked, of twelve soft feathers. Almost all the species have very strong bristles along the base of the upper mandible; and some have the feathers of the face radiated like those of Owls.

The Caprimulginæ, named after the genus Caprimulgus, the extreme absurdity of the name of which seems to be its best recommendation, are remarkable for their nocturnal or crepuscular habits, light and rapid flight, and great activity. They feed on insects, especially nocturnal lepidoptera; but some, it would appear, are properly frugivorous, living on berries. This circumstance becomes less remarkable when we remember that even among the Hirundinæ some, and among the Myiotherinæ many, also feed on vegetable substances. The Caprimulginæ are especially natives of warm climates; but a few species migrate, like the Swallows. They nestle on the ground, in caves, or in hollow trees, and generally lay two eggs. The young are at first covered with down.

The genera of which this family is composed are Steatornis, Podargus, Ægotheles, Nyctibius, and Caprimulgus. The first is characterized by a strong bill nearly half the length of the head, the upper mandible curved and denticulate, the wings having the fourth quill longest. Steatornis caripensis, discovered by Humboldt in South America, although nocturnal in its habits, feeds on fruit, and not on insects, and is said to be intermediate between the Crows and Goatsuckers. The genus Podargus also has the bill strong, although short, bristly radiating feathers on the face, and rounded wings. Its species inhabit New Holland, Van Diemen's Land, and the Indian Archipelago. Ægotheles and Nyctibius form the transition from these genera to Caprimulgus, of which the characters are given in detail in the following pages.

Caprimulgine Birds.

In the order of Volitatores, the Caprimulginæ bear the same relation to the Hirundinæ as the Striginæ bear to the Falconinæ in the order Raptores. Cypselinæ

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. CAPRIMULGUS. GOATSUCKER.

Bill feeble, both mandibles very slender; the mouth extremely wide, the gape-line extending to beneath the middle of the eye; nostrils elliptical, prominent; wings long and pointed; the second quill longest; the first longer than the third; tail long, rounded; tarsus very short, feathered in part; third toe much longer, with its claw pectinate on the inner edge.

1. *Caprimulgus europæus. European Goatsucker.* Grey, minutely dotted and undulated with dusky, variegated with yellowish-red; the head and back with longitudinal black streaks.

Genus I. CAPRIMULGUS. Linn. GOATSUCKER.

Bill extremely small and feeble; upper mandible depressed, being triangular when viewed from above, compressed towards the tip, which is very small and deflected, the edges sharp and inflected towards the end; lower mandible with the angle long, the dorsal outline ascending, the sides extremely narrow, the edges much inflected towards the end, the tip curved upwards; the gape-line commencing nearly beneath the posterior angle of the eye.

The mouth extremely wide; the palate flat, covered with smooth membrane, which is transparent, as are in some measure the bones; the posterior aperture of the nares short, linear, and without marginal papillæ. Tongue, Plate XXII, Fig. 6, *a*, very small, triangular. Œsophagus, *b c d*, rather wide, without dilatation; proventriculus, *c d*, large; stomach, *d e f*, very large, round, membranous, its muscular coat being composed of fasciculi, as in the Owls and Cuckoos; the inner coat thin, soft, with small distant rugæ. The intestine, *f g h j l*, is short; the cœca, *j k k*, large, narrow at the commencement, oblong at the end; the cloaca, *l m*, globular.

Nostrils linear, rather small, with a horny operculum, and placed in the fore part of the large nasal membrane, which is sparsely covered with weak bristly feathers. Eyes very large. External aperture of the ear also very large, of a semilunar form, and similar to that of some Owls.

The general form is slender, the body, when deprived of feathers, being very small; the neck rather short; the head very large, depressed, flattened above. The feet are extremely small; the tarsus very short, roundish, anteriorly feathered, excepting at its lower part; the first toe is very short, slender, and directed inwards; the second and fourth about equal, the

third much longer; the anterior toes directed forward, and connected by membranes as far as the second joint. The claws are very small, arched, compressed, rather blunt, that of the middle toe proportionally longer, curved outwards, and having its inner convex edge expanded and pectinated, being cut into parallel teeth.

Plumage full, blended, very soft; the feathers generally ovate and obtuse. Along the base of the upper mandible is a series of very large flattened bristle-feathers, which are directed outwards. Wings very long and narrow, with twenty quills; the primaries very strong, the second quill longest, the first little shorter, the rest rapidly graduated; the secondaries rather short, broad, and rounded. Tail very long, of ten broad rounded feathers, and generally rounded, but sometimes even, or emarginate or forked.

The Goatsuckers fly in the dusk, in gloomy weather, or in the shade of woods, and feed on insects of various kinds, but especially moths and beetles, which they seize on wing. They move with great velocity, but without producing a noise audible at any distance, and perform their evolutions in the same manner, and nearly with as much ease, as the Swallows. Many authors state that they fly with open mouth; but this assertion is not founded on observation, is contrary to analogy, and indeed to reason; for as the pharynx is wide, and as there is no valve or peculiar stricture on the œsophagus, that and the stomach would necessarily be filled with air, were the bird to advance with velocity. Their feet are not formed for grasping, so that when resting on a bough they generally place themselves directly and not transversely upon it. They often also rest on the ground. They are incapable of walking otherwise than in a constrained and hobbling manner. They breed on the ground, depositing their eggs, which are generally two, in a bare place either exposed or in the shelter of trees. Species of this genus occur in most parts of the globe, but are not numerous. In Britain there is only one, which departs in autumn, to return in the beginning of summer.

These birds exhibit a strong affinity to the Swallows on the one hand, and to the Owls on the other. They resemble the

former in their small bill, wide mouth, and copious viscid salivary fluid; in their long wings, and diminutive feet; and in their flight, mode of seizing their prey, and migratory habits. Their affinity to the Owls is manifested by their very large eyes and ears, adapted to their nocturnal flight, which is like theirs, noiseless and stealthy; in the softness and minute and intricate marking of their feathers, and in the structure and proportions of their digestive organs.

The foot is represented by the accompanying figure, in which the claw of the middle toe is seen to be curiously pectinate.



Fig. 273.

Linn.

1. CAPRIMULGUS EUROPÆUS. THE EUROPEAN GOATSUCKER, ~~OR NIGHTJAR.~~

FERN OWL. CHURN OWL. JAR OWL. DOR HAWK. NIGHT HAWK. Nightjar NIGHT CHURR.

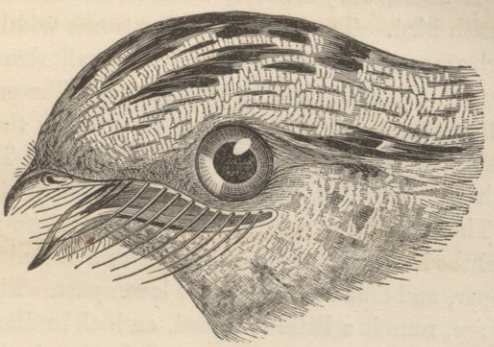


Fig. 274.

Caprimulgus europæus. Linn. Syst. Nat. I. 346.
Caprimulgus europæus. Lath. Ind. Orn. II. 584.
Goatsucker. Mont. Orn. Dict.
L'Engoulevent ordinaire. Caprimulgus europæus. Temm. Man. d'Orn. I. 436.
European Goatsucker. Caprimulgus europæus. Selb. Illustr.
Caprimulgus Europæus. European Goatsucker. Jen. Brit. Vert. An. 160.

Upper parts grey, minutely dotted and undulated with dusky, and variegated with yellowish-red, the head and back with longitudinal black streaks; lower parts transversely undulated with light-red and dusky. In the male, the outer three quills have a large white spot on the inner web, and the two lateral tail-feathers are largely tipped with white. The young in their first plumage are similar to the female, but somewhat darker.

Male.—The general characters of the Goatsuckers given in the preceding pages, apply in all respects to the present species,

of which it is therefore needless to present more than those which are more remarkable or distinctive. Its size is about that of the Missel Thrush ; but although it appears bulky, its body when deprived of feathers is not larger than that of a Song Thrush ; the head is very broad and depressed ; the nostrils inconspicuous, linear-oblong, marginate, and less than a twelfth of an inch in length ; the eyes very large, their aperture five twelfths of an inch ; that of the ear half an inch long. The bill is short, very slender, more feeble than that of any other British bird. The mouth is of extreme width, measuring an inch across. The tongue extremely small, slender, slightly papillate at the base, having also some papillæ on its upper surface, tapering to an obtuse point, its breadth three-fourths of a twelfth, its length two twelfths and a half. The roof of the mouth is nearly flat, anteriorly concave, singularly transparent. The œsophagus which is very thin, is two inches and seven twelfths long, very wide, its diameter being nine-twelfths at the upper, and four-twelfths at the lower part. The stomach is very large, round, a little flattened, an inch in diameter ; its muscular coat very thin, and composed of a single series of fasciculi ; its epithelium very hard, with prominent longitudinal rugæ. The intestine is extremely thin, nine inches long, from three twelfths to a twelfth and a half in width ; the cœca an inch and eight-twelfths long, narrow at the base, enlarging toward the end into an oblong sac, of which the greatest width is four twelfths. The trachea is two inches and seven-twelfths in length, a twelfth and three-fourths in its greatest breadth, of eighty-five rings and five dimidiate rings ; without inferior laryngeal muscles ; the bronchi of about twelve rings. Plate XXII.

The tarsi have about six scutella below ; the first toe, which is very small, and directed inwards, has six, the second nine, the third fourteen, the fourth ten scutella. The claw of the middle toe, Fig. 273, has about ten teeth, but frequently the tip is broken, so that the teeth are reduced to six or seven. The plumage is very soft and blended ; the feathers generally broad and rounded. The bristles at the base of the bill are strong, tapering to a fine point, and flattened. The wings, which are very long,

reach to about an inch from the end of the tail, which is long, and considerably rounded. The second quill is nearly a quarter of an inch longer than the third, and the middle tail-feathers nearly half an inch longer than the lateral.

The bill and claws are dusky; the feet flesh-coloured, the iris brown. The general colour of the upper parts is ash-grey, minutely dotted and undulated with dusky, and variegated with brownish-black and pale yellowish-red, the head and back being marked with elongated spots of the former colour. The quills and tail-feathers are similar, but the outer webs of the primaries are chiefly dusky, with irregular yellowish spots, and on the inner webs of the outer three is a large roundish white spot. The two lateral tail-feathers on each side have also a large patch of white at the end. The lower parts are transversely barred with dull reddish-yellow and dusky, the latter predominating on the breast and fore-neck. On the throat are some white feathers. The bristles of the mouth are black.

Length to end of tail 11 inches, extent of wings 23; bill along the ridge $\frac{4\frac{1}{2}}{12}$, lower mandible along the edge $1\frac{2}{12}$; wing from flexure $7\frac{3}{4}$; tail $5\frac{3}{4}$; tarsus $\frac{8}{12}$; first toe $\frac{2\frac{1}{2}}{12}$, its claw $\frac{1\frac{1}{2}}{12}$; second toe $\frac{5}{12}$, its claw $\frac{2}{12}$; third toe $\frac{9}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{2}{12}$.

Female.—The female is smaller than the male, which it however resembles in colour, but wants the white spots on the quills and tail-feathers, and has the lower parts more yellow.

Length to end of tail $10\frac{1}{2}$ inches, extent of wings $21\frac{1}{2}$; wing from flexure $7\frac{1}{2}$; tail $5\frac{1}{2}$; bill along the ridge $\frac{4\frac{1}{2}}{12}$.

Habits.—Interesting in many respects as are the habits of all the feathered denizens of our woods and wastes, those of the bird which now engages our attention are peculiarly so, on account of the difficulty of observing them, and the mystery with which the darkness of night and the fancy of philosophers have invested it. Were its happiness dependent upon the esteem of the world, or the correctness of the opinions formed regarding it, the Nightjar would indeed lay claim to the sympathy of the benevolent. The ancients accused it of injuring the teats of

goats in its attempts to milk them, and thus it received the names of Caprimulgus and Aegotheles, which, having been translated into the modern tongues, it retains at the present day. Then it was accused of being so awkward as to be obliged to fly with its mouth wide open in order to catch its insect prey, and so slovenly as to need an instrument on its foot with which to brush from its beard the fragments of its food. Nay, so determined have its historians been to misrepresent it, as to hint that it cannot see like other birds, but is obliged first to gape, and then direct its eyes downward, to look through the roof of its mouth, for which purpose that part was made thin and transparent. Now, these fancies it would be idle to refute, were it not that some of them find a place in the works of philosophers considered to be of a higher character, and whom I have been censured for designating as compilers. Therefore it is that I shall refute them. I have examined the mouth and eye in four species of this genus, and what I have to state here I have already stated in the fifth volume of Mr Audubon's Ornithological Biography. In all of them the space between the palatal ridges and the edges of the mandibles is covered with a very thin diaphanous membrane, covering the eye and the cavity of the nose. It is this transparency of the roof of the mouth that has given rise to the idea of its being possible or probable that the bird may direct its eyes so as to look through the palate. But the palate is not so transparent as to enable an ornithologist looking through it to read the title-page of his own book; and therefore much less to enable a bird in the dark or the dusk to discern an insect fluttering in the air. Besides the eye is fixed in its orbit, nearly as strictly as that of an owl, and thus cannot be turned round, which moreover it could only be were it globular, which it is not, it being much depressed, convex only at the base, but having the sides anteriorly concave, owing to the curvature of the sclerotic bones; so that the eye, being naturally directed outward, were the bird to turn it forward and inward, one half of it would project out of its socket, and some of the muscles would be lacerated, unless constructed on a different plan. This I think is common sense. The notion of a bird's flying about

with open mouth, for the purpose of seizing its prey, is not much less preposterous. It has been alleged that Swifts and Swallows do so, but I have satisfactorily ascertained that they do not; and there is no reason to suppose that Goatsuckers are so awkward as to require to keep their jaws constantly wide open, lest their prey should escape them. The pharynx in them has no particular apparatus for closing it, and were a bird having so wide a mouth to rush forward, as it does, with great velocity, its gullet and stomach would be filled with air. Some remarks on the serrature of the claw may be deferred, for it is time that the bird itself should now be introduced.

It is evening; the ruddy streaks of the western sky have faded into a dull purple; the moon already in the heavens sends abroad her pale light; there is silence in the woods, and the hum of men reaches not to this lone place, where tufts of stunted furze cover a plain bounded on one side by tall pines. How soothing to the lacerated feelings, healthful to the care-worn frame, cheering to the soul sick of sin and weary of the world, the placid quiet, the balmy air, and the faint light of this secluded place. Hark! It is the *whirr* of the Fern Owl. Again! nearer, more distant, faint. It has ceased; but there, the creature itself sweeps over head, glides along, flutters, shoots aside, and is off. Many times it may pass you as you linger to inhale the balmy breeze, and you may observe that its mode of flying is not unlike that of the Swallow, like which it pursues its insect prey on wing, feeding on moths and beetles. But one can seldom trace its habits in continuance, and therefore we may at once bring together the results of our observation.

The Goatsucker arrives in England from the middle to the end of May, being among the latest of our summer visitants, and departs about the end of September. It is extensively distributed, but nowhere very common, and in many large tracts is not met with. Dr Edward Moore states that it is common about the South Downs of Devonshire, where it frequents orchards. In the other southern counties it is common, and although it may not have been carefully traced over all the intervening space, until we come to the Scottish border, it has been found so frequently that particular localities need not be pointed

out. In many parts of the southern and middle divisions of Scotland, it is not very uncommon. Both Mr Barclay and the Rev. Mr Gordon inform me that it has often been met with in Morayshire. Even so far north as Shetland Mr Dunn saw a specimen; but in the northern Hebrides I have not heard of its existence.

It is chiefly found on furzy commons, wild bushy heaths, and broken hilly ground covered with ferns, especially in the neighbourhood of thickets and woods. Its food and its manner of procuring it, are well known. The substances which I have found in its stomach were remains of coleopterous insects of many species, some very large, as Geotrupes stercorarius, moths often of great size also, and occasionally larvæ. I have seen the inner surface slightly bristled with the hairs of caterpillars, as in the Cuckoo. As no fragments of the hard parts of these animals ever occur in the intestine, it follows that the refuse is ejected by the mouth. Towards evening the Goatsucker may be seen skimming along the edges of the woods with a light and wavering flight, winding in varied curves, in the manner of a Swallow, but with less velocity, and by its noiseless movements also reminding the observer of that of the Owls. As it proceeds, it now and then emits a shrill whistling cry. It is seldom that more than two or three individuals are seen at a time; but Montagu remarks that he observed "in Scotland eight or ten on wing together in the dusk of the evening, skimming over the surface of the ground in all directions, like the Swallows, in pursuit of insects."

During the day, it generally rests on the ground, among furze or fern, or on the branch or bough of a tree, on which it reposes in a direction parallel to its axis. This arises from the small size and disposition of the toes, which prevent it from grasping a branch in the ordinary manner. On the ground it will often remain crouched until a person goes almost close up to it, and when disturbed it flies off with a wavering buoyant motion, and generally alights on a tree, if there be one not far off.

Mr Harley has favoured me with the following notes of observations made by him in the neighbourhood of Leicester:—

" The Goatsucker visits us annually, but the precise time of its arrival is not very easily marked, and the same may be said of its departure. As it bears some analogy to the Swift, whose arrival and departure are almost certain to a day, one would have thought a similar precision would have been discovered in the Goatsucker. Thus, most of the Swifts retire by the middle of August, and I have never seen a single specimen later than the 10th of September; but the Goatsucker lingers with us until the day and night are equal. Thus, on the 24th of that month, in 1839, I had brought to me a fine male, which was killed early that morning six miles south of Leicester; and Mr Pickard, a bird-stuffer of this town, had two brought to him about the same time. In June 1837, I remained out all night in the grounds of Shugborough Park, Staffordshire, for the express purpose of finding out if possible the use of the pectinated claw of this bird; but I am unable to give any new fact relative to this subject, either from that attempt, or from any subsequent research. In the summer of 1839, I took several trips for the same purpose, and did not leave the haunts of this nocturnal wanderer until the ruddy streaks of the east announced the approach of day. I believe the supposed ventriloquism of this bird is produced by its moving its head about in the same manner as the Grasshopper Warbler, that is, when the note proceeds from it when in a sitting or perching posture. About half-past ten o'clock, in the evening of the 8th of June last, I had a good opportunity of verifying this observation. The weather was fine, the sky without a cloud. Nearly all the diurnal birds had slunk to rest, and every tuneful voice was hushed save the loud mellow note of the Blackbird, the monotonous cry of the Cuckoo, and the *churr-churr* of the Partridge, brought by the gentle breeze upon the awakened ear; when, lo! as I was wandering by the side of one of the lofty stone walls in Bradgate Park, a Fern Owl came and perched directly beside me, and began to trill away his note. The bird being projected as it were against the twilight of the west, I could discern the movements of his head; and just in accordance with them were the different sounds that came upon the ear. Now, this variation of sound is most certainly attributable to

the bird when on the wing; hence the ventriloquism spoken of. The Goatsucker is by no means common with us, probably on account of the absence of large fern-brakes in this county."

The same may be said of a more northern county, where ferns are not uncommon, in which the following observations have been made by another friend, whose name so often recurs in this work, Mr Th. Durham Weir of Boghead, Linlithgowshire.

"In this district, Nightjars do not arrive till the end of May, or the beginning of June. They generally take up their residence in plantations, either amongst heath, or upon sloping banks, where ferns abound. Like Owls, they cannot bear the glare of day, and commonly remain upon the ground until sunset, when they fly abroad in pursuit of their food. They do not take the trouble of constructing any kind of nest. About the end of June 1835, in the middle of a plantation, upon the estate of Herbertshire, in the county of Stirling, now in the possession of William Forbes, Esq. of Callander, I observed a slight hollow scraped in a dry spot surrounded by heath, where two of their eggs had been deposited for the purpose of being hatched. One bright sunny forenoon, I went with the intention of catching the female sitting upon them, but, to my great disappointment, she had been devoured by some bird or beast, as nothing remained but a few of her feathers, which were scattered around the place.

"Some ornithologists maintain that these birds when hawking always fly with their capacious mouths widely extended. This, however, I think, must be a mistake, as I have had several opportunities of watching them, when at no great distance from me, and in quest of moths and beetles for their young. They did not appear to open their mouths till they were just making the attempt to catch their prey. In confirmation of this, I recollect a striking fact. About half-past nine o'clock one evening, in the end of July 1835, whilst I was walking through a large plantation of oak belonging to W. D. Gillon, Esq. of Wallhouse, at the distance of three miles from my house, a pair of Nightjars flew again and again around me, and within a few yards of my head. I shot the male. At eleven

o'clock, as I had just arrived at the door of my house, an acquaintance, who was passing by, enquired of me what kind of bird I had in my hand. After telling him its name, he said that he was very anxious to examine it. I lighted a candle, and upon opening its mouth, he started, exclaiming that it was not yet dead. No wonder he thought so, for in its mouth there were no fewer than four large moths, three of which were alive.

"During the breeding season, and then only when the evening is warm and still, the male, perched lengthwise upon the horizontal branch of a tree, makes a loud noise, which has been compared to that of a spinning-wheel. When flying, he occasionally, like some of the pigeon tribe, strikes the points of his wings so forcibly against each other as to be heard at a considerable distance, emitting at the sametime a sound not unlike that made by a person whistling upon a dog."

Desirous of obtaining a particular account of the whirring noise emitted by the Nightjar, I requested Mr Weir to make it an object of study, should a favourable opportunity occur. He has accordingly favoured me with the following circumstantial and highly interesting account of observations made by him:

"In this parish, only one Nightjar has this season (1839) made its appearance. On Wednesday evening, the 5th of June, between eleven and twelve o'clock, while standing at the door of my house, I heard a male Nightjar uttering very distinctly his whirring sound. On the evenings of the 8th and 9th of the same month, he was heard in a moor about the distance of half a mile from the former situation. He remained silent until Tuesday evening, the 16th of July, when he again whirred in a moor near the south-west corner of the parish. This moor is upwards of a mile in circumference, and surrounded chiefly by Scotch fir trees. On the 20th inst. I went thither to observe his habits. It was a very pleasant evening, and the thermometer at 54°. At the south-west corner of the moor, at five minutes before 9 o'clock, he began to whirr, and continued about two minutes. He then flew about in pursuit of his prey. About ten minutes after 9, he alighted upon the top of a Scotch fir, at the south-

east corner, and continued to whirr for three minutes and a half. After having hawked about for six minutes, he alighted upon a tree at the north-east corner, where he whirred for a short time. He then flew to the north-west corner, where he uttered his whirring sound for one minute and a half. He once rose to the height of about sixty or seventy feet, whistling as he mounted. On this occasion his peculiar mode of flight was similar to that which the male Cushat makes when he rises and falls in the air, at the season of pairing. At a quarter from ten o'clock, after having made almost a complete circuit of the wood, he returned to the same tree upon which he was perched when first heard. After remaining there about two minutes, he flew past me in an abrupt and wavering manner, and was not heard again during that evening. The wind had by this time risen, which perhaps accounts for his silence. His flight was sometimes very rapid, and not unlike that of the Swallow. The particular noise, which has been compared to that of a spinning-wheel, is said by some ornithologists to be produced when the bird is perched with its head lowermost. This, however, is not always the case, for upon this evening I again and again distinctly heard and saw the Nightjar whirring while perched upon the top of a Scotch fir, with his head in a position even more erect than that in which he generally carries it. On Tuesday evening, the 23d, about a quarter before nine o'clock, I again went to watch this bird. I continued upon the moor until half-past eleven, but I neither saw nor heard him, although the wind was south-west, and the thermometer 59°. At nine o'clock on Wednesday evening, the 24th, I again returned, being determined, if possible, to get another glimpse of him. Having remained for an hour in a state of anxiety, I was just upon the eve of departing, when exactly at ten o'clock, in the north-west side of the moor, I heard the accustomed sound, which continued one minute. Having flown about for two minutes in search of moths and beetles, the bird alighted upon a tree at the north-east corner, where he whirred for about four minutes. After a momentary pause he whirred for a similar period; then making another pause for a moment, he whirred three minutes. After having

been engaged for twenty-eight minutes in capturing his prey, and whistling now and then whilst doing so, he sat upon the top of a tree, at the east corner, and whirred six minutes without intermission. Having paused for a second, he whirred other two minutes, and then went in search of food for a short time. From the top of a tree in the south-east corner he whirred five minutes, then having made a momentary cessation he whirred other two minutes. At one minute after eleven o'clock he flew very quickly past me, making a whistling sound eight times. He performed exactly the same circuit round the moor as he had done on the 20th inst., but in the reverse direction, and stopped at the same places as on that evening. Although it was a most charming bright moonlight evening, and the ensuing morning very beautiful, the wind from the south-west, and the thermometer 53°, he did not again whirr. I remained in the moor until twenty minutes to three o'clock. Between eleven and half-past one o'clock, I occasionally heard him whistle. He ceased from feeding when the morning light came in; at least, I did not observe him, although I traversed the moor in every direction. The Nightjar occasionally whirrs between twelve and two o'clock in the morning, sometimes even later."

The serrature of the middle claw of this and the other species has elicited various conjectures as to the use of so curious a structure. Several persons have supposed or imagined it to be for the purpose of enabling the bird to clear away from between its basirostral bristles the fragments of wings or other parts of lepidopterous insects, which by adhering have clogged them. This at first sight seems a remarkably plausible account of the matter, but a very little reflection, with a slight inspection of the parts, will suffice to shew its futility. The bristles are large, strong, and placed at some distance from each other. The teeth of the claw are extremely thin, and very close, being separated only by a mere chink. The claw then cannot act as a comb, because one of the bristles is as broad at the base as two or three of the teeth, so that it cannot enter between them, and although it tapers away towards the end, yet even there it is too wide to be insinuated. But, although the claw may not

act as a comb, it may be said that its serrated edge will more readily than a continuous edge catch hold of any thing stuck between the bristles. This is likely enough; but then the species of the genus Podargus, or strong-billed Goatsuckers have similar bristles, but are destitute of clefts in the claw. Gannets, Herons, and other birds that have no bristles, yet have a serrated claw. Therefore, the serrature is not intended for the purpose of cleaning the bristles. Yet it may be quite true that the Goatsucker uses its claw to produce that effect. But it is not less true that Parrots, Finches, and other birds, having no such serrature, employ their claws for scratching the parts about the head. And thus, another reason must be sought for.

The young Goatsucker has at first no serrature on its claw, any more than the young Gannet. One, fully fledged, and shot about the 10th of September, now before me, has the toe scarcely half the length of that of an old bird, and with only five teeth, the old bird having ten. The chinks in the young bird's claw are less deep than those in the claw of the old bird. A young fledged Gannet shows the same circumstance. All birds whose middle claw is serrated, have that claw elongated, and furnished with a very thin edge. It therefore appears that the serration is produced by the splitting of the edge of the claw, after the bird has used it, but whether in consequence of pressure caused by standing or grasping can only be conjectured. The Flycatchers, and other birds of the same family, which have strong bristles, intended for the same use, have not serrated claws; yet, if their bristles become clogged, they no doubt will clean them in the same manner. It appears then, that the use of the serrature is not that of cleaning from the bristles the scales of lepidopterous insects, because fish-eating birds, without any bristles, have similar serratures; but there is no reason for doubting that Goatsuckers brush away adherent matters with their claws, just as other birds do, the domestic fowl for example.

Another supposition is that the serrature enables the Goatsucker to hold more securely a large insect which it has caught with its foot. And observers have stated that they have been

pretty sure of having seen that bird, when flying, raise its foot to its mouth, as if, in the manner of a parrot, carrying an insect to it. White of Selborne thought he saw it while on wing put out its leg, and bending its head, deliver something into its mouth. He therefore conjectured that it catches its prey with its feet, and that thus the use of the serrature of the middle claw is rendered apparent. But it does not appear that the serrature could have the effect of enabling it to seize an insect more firmly; nor is it likely that a bird having a mouth obviously so well adapted for seizing and retaining insects on wing, should use its feet for that purpose, especially as the great width of the mouth would then be rendered unnecessary, and the bristles at its base form an impediment to the delivery of the insect into it. As yet no one has quite satisfactorily seen a Goatsucker catch a moth or a beetle with its foot; and at all events this cannot be the use of the serrature, for many birds which have the middle claw serrated, do not seize their prey with their feet.

Mr Weir states that in the dusk of a warm summer evening, about the end of June, he has seen the male alight amongst dust, in the middle of a parish road in his neighbourhood. But whether the Goatsucker dusts itself like the Lark and some other birds, he is unable to say, not having had a favourable opportunity of observing them near enough.

The eggs of the Goatsucker are two in number, broadly elliptical, an inch and two-twelfths long, ten-twelfths across, whitish and clouded with ash-grey and brown. The young are densely covered with long whitish down.

Young.—When fledged, the young are similar to the adult female, but of a darker colour, and with the markings considerably larger. They have in this state some resemblance to the young of the Cuckoo, for which it appears they have sometimes been mistaken.

Order VI. Modulatoriæ.

PRACTICAL ORNITHOLOGY.

TENTH LESSON.

"FAUNISTS, AS YOU OBSERVE, ARE TOO APT TO ACQUIESCE IN BARE DESCRIPTIONS AND A FEW SYNONYMS: THE REASON IS PLAIN, BECAUSE ALL THAT MAY BE DONE AT HOME IN A MAN'S STUDY, BUT THE INVESTIGATION OF THE LIFE AND CONVERSATION OF ANIMALS IS A CONCERN OF MUCH MORE TROUBLE AND DIFFICULTY, AND IS NOT TO BE ATTAINED BUT BY THE ACTIVE AND INQUISITIVE, AND BY THOSE THAT RESIDE MUCH IN THE COUNTRY. MEN THAT UNDERTAKE ONLY ONE DISTRICT, ARE MUCH MORE LIKELY TO ADVANCE NATURAL KNOWLEDGE, THAN THOSE THAT GRASP AT MORE THAN THEY CAN POSSIBLY BE ACQUAINTED WITH. EVERY KINGDOM, EVERY PROVINCE, SHOULD HAVE ITS OWN MONOGRAPHER."—*GILBERT WHITE.*

CATALOGUE OF THE LAND BIRDS OF LEICESTERSHIRE.

BY MR JAMES HARLEY.

LEICESTERSHIRE is one of the most central counties in the kingdom. Its surface may be in general designated as table-land. We have no elevations sufficient to excite those feelings of awe which in mountainous countries enforce, even in the mind of the heedless rambler, the conviction of an omnipresent God. The highest eminence is Bardow Hill, 853 feet above the level of the sea, and forming part of Charnwood Forest, the most rugged and picturesque part of the county.

The geological features of the district are far from being unimportant. We have various minerals of considerable value: lime, gypsum, coal, slate, and syenite. The lime, which is found at Barrow, is celebrated for its property of setting under water, and contains remains of Ichthyosauri, Plesiosauri, and other primeval animals. Coal is obtained abundantly on the western side of the county, and in this district metalliferous limestone abounds; besides which, we have a magnesian limestone at Cloud Hill and Breedon. Along the valley of the Soar,

which runs from the south to the northern side of the county, we have the red sandstone, or red marl, abundantly distributed, and intersected here and there with gypsum. Slate occurs at Swithland, and syenite at Markfield, where the rocks assume a very porphyritic character.

Of the southern part of the county, little can be said, except that it stands high in the estimation of the agriculturist for its fertility and rich pasturage. The south-eastern part boasts of its rich Vale of Belvoir, composed chiefly of the blue marl or clay. The most remarkable feature that presents itself to the naturalist is the Charnwood Forest range of hills, forming a ridge which intersects the northern part of the county. The western side of it, which before its inclosure in 1810-11, was rugged and covered principally with fern, gorse, and stunted heath, is now formed into fields, with here and there a patch of barren waste, setting at defiance the powers of man. The south-eastern side of the range is less rugged, and much more fertile. The surface is undulated, the soil chiefly of red marl, and cultivation has made great progress. It is on the extreme southern verge of this range that Bradgate Park abuts, with its old storm-riven oaks, and weather-beaten crags.

From its central situation, Leicestershire cannot boast of any large rivers, although it has many small streams and rivulets. One of our streams joins the Severn, and consequently falls into the Bristol Channel; while another unites with the Humber, which empties itself into the German ocean. Grooby Pool, which is scarcely a mile in circumference, is our largest expanse of water. From the absence of large rivers and lakes, together with our distance from the sea, Grallatorial and Natatorial birds are not numerous with us.

The changes which have taken place, in consequence of the progress of cultivation, have materially altered our ornithology. The Kite, the Bittern, the Curlew, and the Golden Plover, have disappeared from the forest. The Stonechat, the Snipe, and the Woodcock are every year becoming scarcer. On the other hand, the Partridge is becoming abundant in the cultivated parts, while in the woodlands the Pheasant is rapidly increas-

ing. These birds, fostered by the gamekeeper, are taking the place of our waders, and following cultivation to the tops of our highest hills. Our woodlands, which although not very extensive, are more so in the northern parts, consist chiefly of oak, ash, elm, and alder, with white-willow, birch, hazel, and blackthorn for underwood. Here too we have a loss in the Raven; and ere long the Buzzard will probably be extirpated. But whatever may have been the former state of the county, considered with regard to its animal productions, the following Catalogue includes all the species of Land Birds, which, in the course of many years, I have ascertained as now existing in it:—

1. *The Osprey. Pandion Haliaëtus.* Very rare. One was shot several years ago, by Mr Adams, on Grooby Pool.
2. *Peregrine Falcon. Falco peregrinus.* An occasional visitor. Specimens are annually obtained in the county, and may be seen in most collections.
3. *Hobby. Falco Subbuteo.* Occasionally visits our woodlands. A fine specimen was shot by Mr Chaplin, in Martinshaw Wood, in January 1840.
4. *Merlin. Falco Æsalon.* Not very plentiful. Does not breed with us, being only an occasional visitor. Several specimens are killed annually in our woodlands.
5. *Kestrel. Falco Tinnunculus.* Plentiful, but more abundant in summer than in winter, a partial migration taking place in the autumnal months. Makes no nest, but selects the deserted one of the Carrion Crow or Magpie. Preys near to large towns; feeds much on mice, particularly the Long-tailed Field Mouse.
6. *Goshawk. Accipiter Palumbarius.* Very rare; but a specimen is now and then obtained. Used to frequent Oakley and Piper woods; from whence my brother has had specimens sent to him.
7. *Sparrow Hawk. Accipiter Nisus.* Common. Remains with us throughout the year. Nestles in the deserted nest of the Carrion Crow, breeding in most of our extensive and undisturbed woods. Preys much on small birds, makes

sad havoc amongst Dove-cot Pigeons, searches for food late in the evening, and is perhaps the latest preyer of our diurnal non-migrating birds of prey.

8. *Kite. Milvus Ictinus.* Although not many years ago not uncommon, now very rare. A fine specimen was killed by Mr Chaplin, in Martinshaw Wood, in December.
9. *Common Buzzard. Buteo vulgaris.* Not plentiful. Breeds sometimes in Bardow Wood. Used to be very common, and nestles in most of our large woods. Resident, and feeds much on rabbits. Very subject to variations in plumage.
10. *Rough-legged Buzzard. Buteo lagopus.* An occasional winter visitor. Feeds much on rabbits. Thirteen specimens were obtained in these parts in the winter of 1839–40.
11. *Marsh Harrier. Circus rufus.* Occasionally met with, but does not breed in the county.
12. *Hen Harrier. Circus cyaneus.* Now and then met with in the shooting season. Many instances are on record of its bearing away wounded partridges, in despite of the maledictions of sportsmen. Vulgarly called Blue Hawk in these parts.
13. *Long-eared Owl. Otus vulgaris.* Permanently resident. Nestles in hollow trees. Not plentiful now; but used to be found in abundance in Bradgate and Ganendon Parks.
14. *Short-eared Owl. Otus brachyotus.* Common. Found in the autumnal months on wheat stubbles. Feeds much, if not principally, on moles and mice. I never found its nest, and cannot say whether it breeds in this county.
15. *White Owl. Strix flammea.* Plentiful. Permanently resident. Nestles in old hollow or decayed trees, particularly if they are well overgrown with ivy; also in barns, churches, and ruins. Plentiful about the old stables at Bradgate Park. I have seen the young of this species in several stages of growth taken from the same nest.
16. *Tawny Owl. Syrnium Aluco.* Common. Remains with us all the year. Inhabits our closest woods. Nestles early in some hollow tree, well clad with ivy. Remarkable for "hooting." Preys much on young partridges.
17. *Cinereous Shrike. Lanius Excubitor.* Rare. A winter

visitor. I have a fine specimen, a male, killed several years ago at Quomdon. It was in company with a flock of Fieldfares and Redwings.

18. *Red-backed Shrike. Lanius Collurio.* Not uncommon. A summer visitor. Arrives about the middle of May. Breeds with us, and commonly returns to the same locality to nestle, selecting an old pollard crab, ash, or maple. Feeds on chaffers and beetles. Departs in September.

19. *Spotted Flycatcher. Muscicapa Grisola.* A regular summer visitor, arriving towards the 25th of May, and retiring silently about the autumnal equinox. Nestles in holes of walls, trees, and door-posts. Feeds on wing.

20. *Pied Flycatcher. Muscicapa luctuosa.* Very rare. A summer visitor. Chaplin has a young male, which he shot in September, on a tree, on the banks of Grooby Pool.

21. *Water Ouzel. Cinclus europæus.* Rare. Found sometimes upon the streamlets that rise in Charnwood Forest. I do not think it breeds with us.

22. *Missel Thrush. Turdus viscivorus.* Abundant, and permanently resident. Nestles early, in the fork or on the horizontal branch of an apple, cherry, or pear tree, using wool as one of its building materials. Very pugnacious during the breeding season, and afterwards makes great havoc among cherries, gooseberries, &c. In winter gregarious, and associates with other thrushes.

23. *Fieldfare. Turdus pilaris.* A winter visitor, arriving about the beginning of October, and departing in May, or sometimes not until June. Feeds in meadows and pastures, in winter associates with other Thrushes, and approaches villages and towns to feast on the berries of the holly and hawthorn. Roosts on the ground.

24. *Song Thrush. Turdus musicus.* A permanent resident. Abundant. Nestles very early in spring, commonly selects the close-set hedge, thick hawthorn bush, holly, or fir tree. Sings throughout the year, except in the moulting season, and in very severe weather.

25. *Redwing. Turdus iliacus.* A winter visitor, coming in September a few days before the Fieldfare. Very plentiful.

Gregarious, feeding along with other Thrushes. Roosts on trees in deep woods. Leaves us in May.

26. *Blackbird. Turdus Merula.* Plentiful. Permanently resident. Subject to variety.
27. *Ring Ouzel. Turdus torquatus.* An occasional summer visitor to Charnwood.
28. *Hedge Accentor. Accentor modularis.* Plentiful. Sings throughout the year. Subject to variety.
29. *Redbreast. Erithacus Rubecula.* Plentiful. Very pugnacious in the autumnal months. Subject to variety.
30. *Redstart. Ruticilla Phœnicurus.* A summer visitor, arriving toward the end of April, and departing about the autumnal equinox. Frequents old walls about towns; nestling in holes of old walls or buildings, and in hollow pollards, particularly willows.
31. *Stonechat. Fruticicola Rubicola.* Permanently resident. Frequents waste, solitary places, where gorse and fern abound, seldom visiting cultivated lands.
32. *Whinchat. Fruticicola Rubetra.* A summer visitor, arriving about the 20th of April, and departing toward the close of September. Affects our rich and cultivated fields, as well as moist meadows; nestling on the ground.
33. *Wheatear. Saxicola Œnanthe.* A summer visitor. The males arrive toward the close of March, the females about a week after. At first they frequent the fallows and grass fields; then betake themselves to the higher districts of Bradgate Park and Charnwood Forest, where they breed undisturbed in the rabbit holes, and are very plentiful. Departs toward the close of September.
34. *Grasshopper Warbler. Sibilatrix Locustella.* A summer visitor, arriving about the 20th of April. Pretty plentiful, frequenting most of our thick hedge-rows, wherever they are overgrown with brambles.
35. *Sedge Warbler. Calamoherpe phragmitis.* A summer visitor, not arriving before the close of April, and seldom heard till May. Abundant. Affixes its nest to three or four reed-stalks or osiers. Haunts hedges which skirt the woodlands,

where reeds and equiseta grow. Departs toward the close of September.

36. *Reed Warbler. Calamoherpe arundinacea.* A summer visitor. Arrives about the end of April; rarely sings before May; departs about the autumnal equinox. Not so plentiful as the Sedge Warbler; affects the more densely covered willow and osier holts, and seldom leaves the thick and tangled covers, or tall aquatic plants. Fixes its nest to three or four reed-stalks. Mimics the song of other small birds.

37. *Nightingale. Philomela Luscinia.* A summer visitor. Common, but not abundant. Arrives toward the end of April. Found in most of our retired woods; also affects beds of osiers or willows. Found close to Leicester, immediately below the Castle, in a bed of willows, also in the young plantations of oak on the grounds of the Abbey.

38. *Blackcap Warbler. Sylvia Atricapilla.* A summer visitor, coming towards the close of April, and withdrawing in September or October. Plentiful in young plantations, where it hides amid the thickened upper foliage. Nestles in low bushes. A delightful songster.

39. *Garden Warbler. Sylvia hortensis.* A summer visitor, arriving towards the end of April, and departing in September. Plentiful, pretty generally diffused, haunting plantations and gardens, where it nestles; sometimes builds among pea-sticks, or fixes its nest to twigs of rasps, when they are tied up.

40. *Whitethroat. Sylvia cinerea.* A summer visitor, arriving about the middle of April, and departing immediately after the autumnal equinox. Abundant, and generally distributed, haunting all our hedge-rows. When the breeding season is over, frequents kitchen-gardens, to feed on gooseberries and currants.

41. *Lesser Whitethroat. Sylvia garrula.* A summer visitor, arriving about the beginning of May, and departing silently in September. Not uncommon. Affects gardens and shrubberies; nestles in hedges, and amongst gooseberry and rasp bushes. After the breeding season, feeds in concert

with the Whitethroat, Blackcap, Garden Warbler, &c., on gooseberries and currants.

42. *Wood Warbler. Phyllopneuste sylvicola.* A summer visitor, arriving about the middle or end of April, according to the state of the weather, and departing early in September. Common and generally distributed, haunting all our deep retired woods, particularly where beeches abound, amidst the upper foliage of which it appears to disport and sing its truly sylvan notes. Nestles on the ground, or beside a deep retiring bank, beneath the cover of which it forms its nest, which is oval, and composed principally of dry grass. After the breeding season, it visits the neighbourhood and interior of towns, along with the Willow Wren.

43. *Willow Wren. Phyllopneuste Trochilus.* A summer visitor, arriving about the 20th of April, and departing in September. Abundant, and generally distributed, frequenting all our woods. Nestles on the ground. After the breeding season approaches towns, feeding with the Wood Warbler.

44. *Chiff-chaff. Phyllopneuste Hippolais.* A summer visitor, arriving in March, and departing in September. Abundant in all our deep woods. Rarely commences singing until April.

45. *Dartford Warbler. Melizophilus provincialis.* Henry Bickley, Esq. of Melton Mowbray, has given a locality to this bird in Leicestershire; but I have not heard of another instance of its occurrence.

46. *Golden-crested Regulus. Regulus auricapillus.* Permanently resident. Very plentiful, haunting fir plantations. Attaches its nest to the bough of a spruce fir. Feeds wholly upon insects.

47. *Greater Tit. Parus Fringillago.* Permanently resident. Abundant.

48. *Blue Tit. Parus cœruleus.* Permanently resident. Common. Nestles in holes of trees or old walls. In winter associates with Chaffinches, Yellow Buntings, Sparrows, and other small birds, feeding in farm-yards amongst domestic poultry, or clinging to the sides of corn-stacks.

Haunts towns throughout the year. Attacks birds of prey, and clamours loudly against the Red-backed Shrike.

49. *Cole Tit. Parus ater.* Permanently resident. Abundant, and generally dirtributed. Associates with its congeners, the Blue, Marsh, Great, and Long-tailed Tits, feeding in harmony with them. Haunts trees in gardens, in the middle of towns.

50. *Marsh Tit. Parus palustris.* Permanently resident. Abundant, haunting deep woods, as well as hedge-rows. Associates with its congeners, and is found at times in the midst of towns, feeding upon insects and larvæ. In deep woods very generally affects the underwood, where the white willow and hawthorn abound.

51. *Long-tailed Tit. Mecistura longicaudata.* Permanently resident. Common and generally distributed. Nestles early, often in February, making an oval domed nest, most beautifully constructed, and profusely lined with feathers. I have known it lay ten, twelve, and even fourteen eggs. The young keep together in families until spring.

52. *Bohemian Waxwing. Bombycilla garrula.* A casual winter visitor. Jan. 5th 1835, three of these birds were killed at Loughborough by Mr George Nash, as they were sitting upon a rail. Their crops were found to contain berries of the mountain ash and haws.

53. *Pied Wagtail. Motacilla alba.* Permanently resident. Common, and generally distributed. Partially migrates in winter. Nestles on the ground, under banks, where they are hassocky, on stacks of wood, &c. In August and September congregates into large bodies in the evenings, and roosts among aquatic plants in osier beds.

54. *Grey Wagtail. Motacilla Boarula.* A winter visitor with us. Haunts the same localities as the Pied Wagtail, that is low flat lands, drains, mill banks, and the sides of canals and rivers.

55. *Ray's Wagtail. Budytes flava.* A summer visitor to this county, arriving in the end of April. Affects our uplands, and is a great frequenter of our cow pastures. In

August, congregates with the Pied species, and roosts in thick aquatic herbage, in beds of osiers and willows. Leaves us in September.

56. *Tree Pipit. Anthus arboreus.* A summer visitor, arriving towards the end of April, but seldom singing much before May comes in, and departing in September. Nestles upon the ground. Sings while perched on a tree or bush, also when he rises in the air, descending in a joyous manner, making the woodlands resound to its pleasing ditty.

57. *Meadow Pipit. Anthus pratensis.* Permanently resident. Widely distributed. Nestles on the ground. Has a pleasing song, not unlike that of the Tree Pipit. Affects our fields and pasture grounds. Commences its song early in the season.

58. *Sky Lark. Alauda arvensis.* Plentiful throughout the year.

59. *Wood Lark. Alauda arborea.* Permanently resident. Abundant in our woodlands, and generally distributed.

60. *Snow Bunting. Plectrophanes nivalis.* A winter visitor. Specimens are obtained nearly every winter. I have repeatedly seen them in the adjoining county, above Buxton, on those wild moors.

61. *Common Bunting. Emberiza Miliaria.* Permanently resident. Common and generally distributed. Nestles about the middle of April, in open corn fields, as well as beside the banks of ditches. In winter, becomes gregarious, and flocks with Chaffinches, Sparrows, and other small birds, frequenting farm-yards, and clinging to the stacks.

62. *Black-Headed Bunting. Emberiza Schœniclus.* Permanently resident. Abundant. In winter becomes partly gregarious, and flocks with Chaffinches, Sparrows, &c., to feed in farm-yards. Nestles in willow holts, on canal banks, and amongst hassocks and sedges, in low and wet lands.

63. *Yellow Bunting. Emberiza Citrinella.* Permanently resident. Abundant, and generally distributed, occurring in all kinds of situation. Gregarious in winter.

64. *Cirl Bunting. Emberiza Cirlus.* Although I am sure we

have this bird, I cannot speak as to the extent of its distribution or habits.

65. *Chaffinch. Fringilla Cœlebs.* Permanently resident. Abundant. Very destructive to the buds of the cherry and apple. Subject to variety in plumage. In winter gregarious.

66. *Mountain Finch. Fringilla Montifringilla.* A winter visitor. Nearly every year many specimens are obtained. I have noticed it in Staffordshire, feeding in company with Chaffinches, Linnets, and Buntings, on the stubbles, and in the farm-yards.

67. *Tree Sparrow. Passer montanus.* Permanently resident, and pretty extensively distributed.

68. *House Sparrow. Passer domesticus.* Permanently resident. Extremely abundant. Subject to variety in plumage.

69. *Green Finch. Linaria Chloris.* Permanently resident. Abundant, and generally distributed. In winter gregarious.

70. *Hawfinch. Coccothraustes atrogularis.* A winter visitor, or straggler. Feeds on haws, seeds of the hornbeam, and berries of the mountain-ash and ivy. Visits Ganendon Park, in parties of five or six. Several were shot in 1839-40, about the woodlands of Ansty.

71. *Goldfinch. Carduelis elegans.* Abundant throughout the year, although not so numerous as formerly, the improvements in agriculture having extirpated many of the weeds on which it used to feed.

72. *Siskin. Carduelis spinus.* A winter visitor. Rather rare, appearing now and then in little parties of five and six, haunting waste lanes, where thistles abound. It does not stay to breed with us.

73. *Common Linnet. Linaria cannabina.* Abundant throughout the year. Nestles in the holly hedge, hawthorn bush, and gorse. Gregarious after the breeding season, associating with Chaffinches, Sparrows, and other small birds, frequents stubble-fields, and close sequestered lanes, and in winter haunts farm-yards.

74. *Lesser Redpoll. Linaria minor.* Common with us in the winter season, keeping in happy parties, affecting the stubbles, and at times associating with the Goldfinch.

75. *Mountain Linnet. Linaria flavirostris.* A winter visitor. Rather rare.

76. *Bullfinch. Pyrrhula pileata.* Permanently resident. Abundant in all our woodlands, affects also orchards, plantations and shrubberies. In spring is very injurious to fruit trees, particularly the cherry, by devouring the buds. Seldom commences the work of nidification before the middle of May. The young remain in families with their parents till the next breeding season.

77. *Common Crossbill. Loxia europœa.* An occasional visitor. Breeds with us. Mr Adams, of Bradgate Park, states, that he found a nest and five young ones in a spruce fir tree on the boundary of the park, in 1839. The birds and young ones went away. I have seen many specimens obtained in this county. As many as nineteen were killed from a flock in the winter of 1838-9, at Widmerpool. That winter they were very numerous throughout the island, and many were wantonly killed and destroyed. I attribute the numerous visits of these birds to the rapid increase of late years of our fir plantations, which are now getting into bearing their cones.

78. *Starling. Sturnus vulgaris.* Abundant throughout the year. Gregarious, and social, flocking with Rooks, Jackdaws, and Fieldfares, searching the pastures for slugs, beetles, and worms. Nestles early in the season, under the cottage thatch, the gable-end of the farm-house or manse, the solitary ruin, the venerable gateway, or the lofty tower; also in the aged oak, the hollow ash or beech, or fantastic maple; likewise in dovecots and pigeon-houses. Although this bird becomes decidedly gregarious or social, after the breeding season, yet a few pairs remain attached to their breeding haunts throughout the autumnal and brumal months in a state of widowhood or companionship.

79. *Rose-coloured Pastor. Pastor roseus.* A rare straggler. A fine specimen was killed some years ago near to the banks of the Trent, in the Lordship of Castle Donnington, in this county.

80. *Raven. Corvus Corax.* A very rare straggler. Indeed I

am not certain that it ought to be admitted into this list. Although it formerly nestled in Ganendon and Bradgate Parks, as well as in Martinshaw Wood, I believe it never breeds with us now.

81. *Carrion Crow. Corvus Corone.* Permanently resident. Very common; but more plentiful in the southern than in the northern parts of the county. Nestles early in February, selecting the oak, ash, or spruce fir. Has been known to nestle also in September. Keeps in families until spring. Rather unsocial as regards other birds, but is sometimes found with the Rook. Haunts flat lands and meadows near to large towns. Omnivorous. Retires to roost very late in the evening.

82. *Hooded Crow. Corvus Cornix.* A winter visitor, arriving about the middle of November. Not very plentiful, although far from being rare. Feeds along with the Rook, Jackdaw, Starling, and Thrushes, haunting our meadow lands and low pastures.

83. *Rook. Corvus frugilegus.* A permanent resident. Abundant. Gregarious, and while feeding associates with the Jackdaw, Starling, Sea Gull, and other birds. Nestles early in spring, selecting the oak, elm, ash, poplar, and sometimes the willow. The young come abroad early in May. Not so omnivorous as the Carrion Crow. White individuals sometimes occur.

84. *Jackdaw. Corvus Monedula.* A permanent resident. Abundant. Nestles in May, affecting for that purpose the old abbey, the venerable cloister, the lofty tower, and the deserted chimney. Besides, it haunts the decayed oak, ash, beech, and maple. The young come abroad in June. After the breeding season courts the society of the Rook, and becomes gregarious. Subject to variation in colour.

85. *Magpie. Corvus Pica.* Permanently resident. Abundant. Nestles very early, in the elm, ash, oak, not unfrequently in a hawthorn bush, or in the hawthorn hedge, making a domed nest of sticks and twigs, which it plasters internally with clay, and lines with fine fibrous roots or grasses. The nest may be found near towns, as well as

in deep shady woods, not unfrequently in the cottage orchard, as well as high up in the ash or elm near the mansion or in the farm-yard.

86. *Jay. Garrulus glandarius.* Permanently resident. Abundant. A truly sylvan bird. Nestles in the hazel, the young oak mantled with woodbine, also in the hawthorn bush growing in the silent wood. After the breeding season, Jays keep together, and feed much upon garden produce, such as pease, currants, and cherries. Rarely found far from the hedgerow, copse, plantation, or wood.

87. *Green Woodpecker. Picus viridis.* Permanently resident. Plentiful. Returns annually to the same nestling-places, commencing about the middle of May. The young are abroad about the middle of June. Haunts our hedgerow trees in the spring months, and approaches large towns; utters its "loud laugh," as White calls it, when it is boring for ants' eggs on the mound or grassy hillock, as well as when it is climbing, and tapping for insects on the bole of the decayed ash, chestnut, beech, oak, or maple. Solitary in its habits. Abundant in Bradgate and Ganendon Parks.

88. *Greater Spotted Woodpecker. Picus Major.* Permanently resident. Generally distributed, but not so often seen as the Green Woodpecker. Inhabits the closest and deepest woods, where it nestles undisturbed. Found in Martinshaw, Grooby, and Ulverscroft Woods, near to Leicester.

89. *Lesser Spotted Woodpecker. Picus minor.* Permanently resident in our parks and woodlands. Nestles in Oakley and Piper Woods, where it is not very uncommon. When the weather is severe in winter, it leaves the parks, and frequents large, extensive, and unfrequented woods. By the country-people it is called the *Tabberer* or *Tapperer*, from the noise it makes when tapping for insects.

90. *Wryneck. Junx Torquilla.* A summer visitor, arriving about the vernal, and departing towards the autumnal equinox. Not uncommon in our woodlands. Affects gardens, orchards, old enclosures, and particularly where pollard and stunted trees are found. Very partial to old and decayed plum trees. Also frequents grass plots. Emits from the

ground, as well as from trees, its monotonous cry, which sounds like the syllable *pee*, *pee*, *pee*, *peee*, sharply reiterated.

91. *Common Creeper. Certhia familiaris.* Permanently resident. Common. Nestles rather early, in the space between the bark and the wood, where a separation of the former from the trunk has been made. Haunts the same locality from year to year.

92. *Wren. Troglodytes vulgaris.* Permanently resident. Abundant and generally distributed. Nestles very early, forming a large domed nest of moss, fixed among the ivy attached to the trunk of a tree, on a ditch bank, in a hole in a wall, or beside a hay-rick. In winter, when the weather is very severe, it haunts out-buildings, and will affect disused tunnels or kitchen chimneys, several individuals huddling together for warmth.

93. *Hoopoe. Upupa Epops.* A summer straggler. A specimen was shot by Mr Adams in Bradgate Park, in the summer of 1834, and is now in his possession; but I have not heard of another individual occurring in this county.

94. *Nuthatch. Sitta Europæa.* Permanently resident. Affects our woodlands, parks, and pleasure-grounds. Plentiful, though rather local; abundant in Bradgate and Ganendon Parks. Begins to nestle toward the end of April; lays six or seven eggs on a few dead leaves, or rotten wood, in a hole in an old decayed ash or elm, plastering the mouth of the hole with mud, to secure itself against the attacks of the Green Woodpecker, which haunts the same locality.

95. *Common Cuckoo. Cuculus canorus.* A summer visitor. Plentiful, and widely distributed. Visits us about the middle of April, although its note is not usually heard before May, and departs in September. Two white individuals were killed on the estate of Lord Aylmer at Batchacre Hall, Shropshire, in the summers of 1833 and 1834.

96. *Common Kingfisher. Alcedo Ispida.* Permanently resident. Common and widely distributed. Nestles in holes in banks of brooks and rivers. Makes no nest, but deposits

six or seven most beautiful white and somewhat transparent eggs in the upper end of a rat's hole, which the bird frequents from year to year. Frequents also pools and fish-ponds.

97. *Chimney Swallow. Hirundo rustica.* A summer visitor, appearing about the middle of April, a few days after the Bank Martin. It is first seen about ruins, particularly if there is much water around them. Abundant and widely dispersed. Nestles in a few weeks after its arrival, in barns, out-houses, chimneys, and other places; making its nest of mud intermixed with a few straws, and lining it with fibres and feathers. The young come abroad in June. These birds generally muster for migration towards the middle of September. On the evening of 10th September 1839, just as our chimes were going six, myriads upon myriads of swallows assembled in the air over the south-eastern part of the town, until the whole face of the heavens became literally peopled with them. They made various circuits, gliding backwards and forwards, and then dropping in vast multitudes, settled in the willow bed beneath the castle, making the holt alive with their twitterings.

98. *Martin. Hirundo urbica.* A summer visitor, arriving a few days after the Chimney Swallow, and at first haunting rivers in the vicinity of ruins. Abundant, and generally distributed. Departs about the end of September.

99. *Bank Martin. Hirundo riparia.* A summer visitor, arriving early in April. Abundant, haunting most of our gravel-pits, and sand-holes, where it nestles in holes which it excavates for itself. Departs immediately after the autumnal equinox.

100. *Swift. Cypselus murarius.* A summer visitor, arriving in the first week of May, and departing early in September. Common, and generally distributed.

101. *Alpine Swift. Cypselus alpinus.* On the 23d September 1839, at half-past five in the evening, I saw, to my astonishment, a bird of this species, gliding along, in a southerly direction, at the height of fifteen or twenty yards. From

the stretch of its wings, and the white colour of its lower parts, it could not be mistaken.

102. *Goatsucker. Caprimulgus Europæus.* A summer visitor, not arriving before the middle of May, and departing toward the end of August, although individuals remain nearly to the end of September. Haunts most of our deep and retired woods, plantations, copses, marsh scrubs, and waste lands, locally found in Bardow, Grooby, and Ulverscroft Woods, and their outskirts. Lays two eggs, in a slight depression, on the ground, under fronds of fern.

103. *Ring Dove or Wood Pigeon. Columba Palumbus.* A permanent resident. Abundant. Nestles in most of our woods and plantations. Gregarious in the winter months, when it feeds on clover, turnip tops, &c.

104. *Stock Dove. Columba Œnas.* A permanent resident. Plentiful about Bradgate Park, nestles in the old pollard storm-riven oaks, with which it abounds. In the brumal months, forms small parties, which feed with the Wood Pigeons.

105. *Rock Dove. Columba Livia.* A straggler. This bird used to abound in Leicestershire, and nestle amongst the rocks of Sharpley and Benscliff, on Charnwood Forest. I have seen specimens obtained there some years ago.

106. *Turtle Dove. Columba Turtur.* An occasional summer visitor. Chaplin has shot several specimens about the woodlands of Grooby. In the adjoining county, Staffordshire, it is very abundant, principally frequenting the barley lands.

107. *Common Pheasant. Phasianus Colchicus.* Common, abounding in most of the large preserves in the county. Affects principally clay lands, where beans and wheat prevail. Subject to variety in plumage. Will mix freely with the domestic fowl, and produce hybrids.

108. *Black Grouse. Tetrao Tetrix.* Permanently resident. Not plentiful; but a few may always be found upon the rough uncultivated tract of waste table-land about the Monastery, where some pairs annually breed.

109. *Common Partridge. Perdix cinerea.* Permanently resi-

dent. Abundant, and widely dispersed. Very subject to malformation of the bill, of which I have seen many examples.

110. *Common Quail. Perdix Coturnix.* A summer visitor. Not uncommon. A few pairs annually nestle in the meadows bordering the Soar. In June found in the meadows about Loughborough and Cossington.

Of the 110 species here enumerated, 55 are permanently resident; 29 summer birds which breed with us, but depart in autumn; 9 regular winter visitors; and 17 stragglers or irregular visitants, some of which appear in summer, and others in winter.

The above List, the only one hitherto published, of the Birds of Leicestershire, will, I trust, in so far as it goes, be found to afford a correct idea of the number and distribution of our Terrestrial species. The Aquatic birds, which are proportionally fewer, will form the subject of another list.

Ganendon Park, mentioned in these notes, belongs to Charles March Phillips, Esq., formerly Member of Parliament for this county, and lies on the northern verge of Charnwood Forest. It contains about four hundred and twenty acres, is finely wooded, and abounds with deer. There was an Abbey here formerly, founded in 1133, by Robert Bossu, Earl of Leicester, as a cell to Waverly Abbey, for monks of the Cistertian order.

Bradgate Park belongs to the present Earl of Stamford, and is celebrated as being the birth-place of Lady Jane Grey. The mansion is now in ruins. The park is large, contains much deer, and, being situated in the midst of little-explored woodlands, is highly interesting to the ornithologist.

It seems somewhat strange that migration should be so little influenced by the state of the weather, and that in the remarkably genial spring of 1840, our summer birds should not have arrived at an earlier period than usual. A single Swallow was

seen here on the 18th of April, and two were observed on the 20th. The Willow Wren arrived on the 15th. The Cuckoo was first heard on the 20th; the Tree Pipit and Whitethroat on the 23d; the Sedge Warbler on the 25th; the Whinchat, Redstart, and Yellow Wagtail on the 28th. My brother states that the Martins did not arrive at Loughborough till the 24th; and the Swifts have only come two days earlier than last year. Although the weather has been so fine with us, it may however have been the reverse in the countries to the southward through which the migratory birds had to pass. Yet that their journeys are not determined merely by an increase of temperature, seems from many considerations to be apparent.

Order III. Excursoriæ. Excursorial Birds.

~~XII. JACULATORES. DARTERS.~~

THE Fissirostral Birds of authors ~~form an extremely hetero-~~ include all the families of this and the preceding order, together with the Swallows, which, being formed on a different type, must be excluded from both.

~~geneous association, as will be apparent to the student who places before him skins of a Bee-eater, a Kingfisher, a Jacamar, a Swallow, a Swift, a Goatsucker, and a Roller, these birds scarcely agreeing in any other character than that of having~~ They scarcely agree in any other character than in more or less having a wide throat and very small feet, which however differ in several respects. The ~~Swallows~~, Swifts, and Goatsuckers, I have referred to an order apart; the Rollers ~~I have placed among the Excursores, and there now remain to be arranged the Kingfishers and those genera closely allied to them~~. With our common European Kingfisher, we find a great number of birds in Africa, Asia, and America, that agree in form and habits, constituting the genus Alcedo, characterized by its long, straight, four-sided, compressed, and pointed bill, and very diminutive feet, of which the anterior toes are more or less coherent or syndactyle. Other birds very similar, but having the bill much stouter, form the genera Halcyon, and Dacelo, which are said to differ from the Alcedines in not plunging into water, to capture small fishes. The feebleness of the feet of these birds incapacitates them from walking or hopping, so that they merely assume a station, whence to dart upon their prey, or to which they return after an extended flight. Their wings are short or of moderate length, but always of great breadth; and their flight, although seldom buoyant, is always rapid. In the form of their feet, the Bee-eaters agree with the Kingfishers; their

Todies, Bee-eaters, Jacamars, Kingfishers, and some other groups, perhaps the Humming Birds, belong to the present series.

bill is very similar, although somewhat arched; and their wings differ only in having the primaries more elongated. Nearly allied to these are the Jacamars and others, which have the feet zygodactyle; and to the same group may be referred a number of genera, chiefly tropical, which connect the Alcedinæ with the Excursores, and especially with the Psarinæ and Laniinæ. But of these there is hardly occasion to speak, as in Britain there are only two representatives of the single family of Alcedinæ.

All the species of the genus Alcedo are believed to feed chiefly on small fishes, which they seize by plunging into the water; and for this reason I at first proposed giving the name of Immersores to the group. But the thick-billed Kingfishers of the genus Halcyon, are supposed to live on insects; and the Bee-eaters are not known to capture fishes. Their peculiar mode of flying has suggested to me the idea of naming them Darters, a term not more fanciful as applied to them than to the genus Plotus. If Jaculator signifies, not one who darts, or moves with the rapidity of a dart, but who casts darts from him, yet a Kingfisher, not having the power of casting his, unless by propelling it by following, is not the less a Darter.

The form of their bill and their peculiar mode of flying formerly suggested the name of Jaculatores, or Darters, as applicable to these birds. That of Excursorii, however, is, I think less exceptionable. Many of the birds, it is true, are excursorial, — hawks and thrushes, for example; and it would be very difficult to find an unexceptionable name for any group of birds, great or small. This order may be considered as characterized and distinguished by an elongated bill, a wide throat, membranous stomach, coeca wanting in some, large in others, and very small, zygodactylous feet, unfit for being used for walking. The families which have representatives in Britain are: — Alcedinidæ, Meropidæ, and Coraciidæ. Except the Common Kingfisher, which is resident, the other three species that occur with us, are merely accidental visitants.

Family I. ~~Order III~~ IV ALCEDINÆ. Alcedinine Birds.

KINGFISHERS AND ALLIED SPECIES.

The birds of this group are of small or moderate size, with the body compact, the neck short, the head rather large and oblong. The bill is longer than the head, straight, or slightly arched, opening to beneath the middle of the eye, pentagonal at the base, four-sided in the rest of its extent, compressed, and tapering to a point. The tongue is very short, fleshy, with the sides nearly parallel, and the tip bluntish. The œsophagus is wide; the stomach very large, roundish, somewhat compressed; the intestine long and very slender, without cœca. Plate XXII, Fig. 7. The feet are very small; the tarsus short and bare; the toes small; the first smallest and directed backwards; the anterior united in part of their extent, and incapable of spreading; the claws well-curved, slender, compressed, acute, but feeble, having very thin margins. The plumage is blended but generally firm, and often highly coloured. The wings are of moderate length, broad, of about twenty-three quills. The tail of twelve feathers, but varying in length and form.

SYNOPSIS OF THE BRITISH GENERA AND SPECIES.

GENUS I. ALCEDO. KINGFISHER.

Bill straight, longer than the head, four-sided, compressed, and tapering to a point; feet very small; tibia bare at its lower part; tarsus extremely short, roundish, with indistinct scales; toes feeble, the second little longer than the first, the

third and fourth united for more than half their length; wings rather short, broad, somewhat rounded; tail rather short, and rounded.

1. *Alcedo Ispida. European Kingfisher.* Upper parts green and light blue; lower parts yellowish-red.

GENUS ~~II.~~ I. MEROPS. BEE-EATER.

Bill arched, longer than the head, four-sided, compressed, and tapering to a point; feet very small; tibia bare at its lower part; tarsus extremely short, roundish, with indistinct scales; toes feeble, the second nearly as long as the fourth, which is united with the third for more than half its length; wings long, broad, pointed, but with the first quill extremely small; tail long.

1. *Merops Apiaster. Yellow-throated Bee-eater.* Upper parts chiefly yellowish-red; lower light green; throat yellow, with a transverse dusky band.

Genus II. Ceryle.

1. Ceryle Alcyon.

Family II. Meropinæ.

Linn.

Genus I. ALCEDO. KINGFISHER.

The genus Alcedo is composed of species generally remarkable for the brilliancy of their plumage, and which are for the most part natives of the warmer regions of the globe. They are of a short and rather robust habit, with the neck short, the head large and oblong, the wings broad and rather short, the tail abbreviated, and the feet very small.

The bill is straight, longer than the head, pentagonal at the base, then four-sided, compressed, and tapering to a point. Upper mandible with the dorsal outline declinate and almost straight, the ridge narrow, carinate, slightly flattened, the sides sloping, the edges direct, sharp, and overlapping, the tip acute and destitute of notch; lower mandible with the angle short and rather acute, the dorsal outline ascending and slightly convex, the ridge narrow, the sides sloping outwards and nearly flat, the edges sharp, the tip acute. The gape-line straight, at the base a little declinate, and extending to beneath the middle of the eye. The upper mandible concave, with a slightly prominent middle line; the lower more deeply concave, with a more prominent line; the palate flattened. The tongue, Plate XXII, Fig. 7, *a*, very small, fleshy, flattened, broad, with a suddenly contracted tip. The œsophagus, *b c d*, very wide, without crop; the stomach, *d e f*, large, with a very thin muscular coat, and a soft rugous epithelium; intestine, *f g h k*, of moderate length, very slender; no cœca; cloaca, *j k*, very large and globular.

Nostrils linear, direct, in the lower and fore part of the short nasal membrane, which is covered with short feathers of ordinary texture, and directed backwards. Eyes of moderate size; eyelids feathered near the edges, which are crenate. External aperture of ear rather small, and roundish.

The feet remarkably small and feeble; the tibia bare above the joint; the tarsus extremely short, roundish, or transversely

flattened; its scales indistinct. Toes short and very slender; the hind toe proportionally small, beneath broad and flattened; the anterior toes parallel, the inner shorter, and free beyond the second joint; the third not much longer than the fourth, with which it is united to half its length; the scales indistinct. Claws arched, compressed, acute, laterally grooved, the hind claw not so large as the rest, the middle claw with a slightly dilated thin inner edge, the sharp margins of the anterior claws running, in our species, into the point, so as not to leave notches, which, however, is the case in many.

Plumage generally soft and blended, but varying in texture; the feathers oblong, with the barbs separated; those of the hind head generally, and of the rump often, elongated. Wings rather short, very broad, concave, rounded; the quills twenty-five; the primaries not much longer than the secondaries; the first quill extremely small, the second considerably shorter than the third, which is about the same length as the fourth; the other primaries diminish slowly; the secondaries of moderate breadth, and rounded. The tail short, rounded, of twelve moderately broad, soft, rounded feathers.

The Kingfishers, as above characterized, are extensively distributed over the old continent, the Indian islands, and Australia. They feed on small fishes and insects, which they procure by darting upon them from an elevated place. They generally nestle in holes, feed their young with fish, and are of solitary habits. Only a single species occurs in Britain.

1. ALCEDO ISPIDA. Linn. Common ~~HALCYON~~ KINGFISHER.

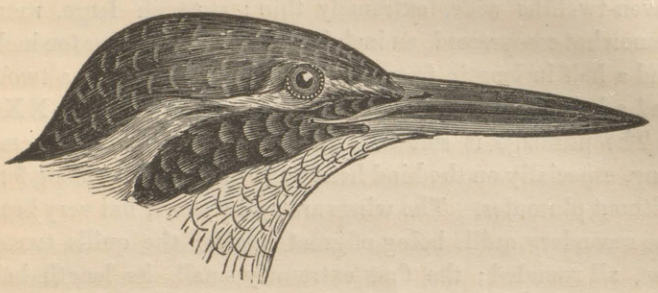


Fig. 275.

Alcedo Ispida. Linn. Syst. Nat. I. 179.
Alcedo Ispida. Lath. Ind. Orn. I. 252.
Common Kingfisher. Mont. Orn. Dict.
Martin-pecheur Alcyon. Alcedo Ispida. Temm. Man. d'Orn. I. 423.
Common King's-fisher. Alcedo Ispida. Selb. Illustr. I. 136.
Alcedo Ispida. Common King-fisher. Jen. Brit. Vert. An. 157.

Upper part of the head and wing-coverts dull green spotted with light blue; middle of the back and rump glossy light blue; throat and a patch on the side of the neck yellowish-white; lower parts yellowish-red. Female similar.

Male.—The ~~Halcyon~~ Common Kingfisher, although one of the least elegantly formed of our native birds, is among the most distinguished for the beauty of its plumage, which is such as at once to recal to mind the splendour of the feathered denizens of the tropics. Its large body, short and thick neck, disproportionately long bill, diminutive feet, and abbreviated tail, give it a peculiar appearance, so that the least observant cannot mistake it for any other bird. The bill is considerably longer than the head, straight, rather slender, higher than broad in its whole length, four-sided, its outlines almost straight, and its

tip pointed. The very short tarsi are roundish, and destitute of defined scales; the first toe shorter than the second, the third slightly longer than the fourth; the claws arched, slender, compressed, and acute.

The tongue is triangular, sagittiform, flat, rather acute, a quarter of an inch long. The œsophagus three inches long, seven-twelfths wide, extremely thin; stomach large, round, somewhat compressed, an inch in diameter; intestine ten inches and a half in length, from two and a half twelfths to a twelfth and a half in width; no cœca; cloaca globular. Plate XXII.

The plumage is soft and blended; the feathers generally long, especially on the hind head and rump; of an oblong form, without plumules. The wings are rather short, but very broad, the secondary quills being of great length; the quills twenty-five, all rounded; the first extremely small, its length being only three-twelfths of an inch, the second two and a half twelfths shorter than the third, which is longest, but scarcely exceeds the fourth; the rest slowly diminishing. The tail is very short, a little rounded, of twelve rather narrow, rounded feathers.

The upper mandible is dark brown, as are the margins and tip of the lower, the remaining part being pale orange. The iris hazel. The tarsi and toes orange red; the claws dark brown. The upper part of the head is dull green, each feather with a transverse bar of light greenish-blue near the end; the hind-neck, sides of the back, scapulars, and wing-coverts are of a similar dull green, tinged with purple in a different light, the latter feathers tipped with light blue. The middle of the back, the rump, and tail-coverts are of a beautiful glossy light greenish-blue; the tail of a duller purplish blue. The quills are brown, with the outer webs dull green. A band of yellowish-red from the nostril to the eye; part of the loral space dusky; behind the eye, a similar yellowish-red band, below which, and extending from the lower mandible is a band of greenish-blue, terminating behind in a yellowish-white patch. The throat is of the latter colour, and the rest of the lower parts yellowish-red, of a richer tint anteriorly.

Length to end of tail $7\frac{1}{4}$ inches; extent of wings $10\frac{1}{4}$; bill along the ridge $1\frac{1}{2}$, along the edge of lower mandible $1\frac{10\frac{1}{2}}{12}$; wing

from flexure $3\frac{2}{12}$, tail 2 ; tarsus $\frac{4\frac{1}{2}}{12}$; first toe $\frac{2\frac{3}{4}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; second toe $\frac{2\frac{3}{4}}{12}$, its claw $\frac{2}{12}$; third toe $\frac{6\frac{1}{2}}{12}$, its claw $\frac{5}{12}$; fourth toe $\frac{6}{12}$, claw $\frac{2\frac{3}{4}}{12}$.

Female.—The female is somewhat smaller, but similar in colour, the tints being only a little less bright.

Variations.—In adults there are considerable differences, not in the distribution, but in the tints of the colours. The older the individuals are, the more bright is the green of the upper parts, and the lighter the blue on the back, which thus may be purplish blue, ultra-marine, smalt, or verditer.

Habits.—The woods are resuming their green mantle, and the little birds chanting their summer songs. From afar comes the murmur of the waterfall, swelling and dying away at intervals, as the air becomes still, or the warm breezes sweep along the birchen thickets, and ruffle the bosom of the pebble-paved pool, margined with alders and willows. On the flowery bank of the stream, beside his hole, the water-rat nibbles the tender blades ; and on that round white stone in the rapid is perched the Dipper, ever welcome to the sight, with his dusky mantle and snowy breast. Slowly along the pale blue sky sail the white fleecy clouds ; as the lark, springing from the field, flutters in ecstacy over his happy mate crouched upon her eggs under the shade of the long grass, assured that no rambling urchin shall invade her sanctuary. But see, perched on the stump of a decayed willow jutting out from the bank, stands a Kingfisher, still and silent and ever watchful. Let us creep a little nearer, that we may observe him to more advantage. Be cautious, for he is shy, and seeks not the admiration which his beauty naturally excites. There he is, grasping the splint with his tiny red feet, his bright blue back glistening in the sunshine, his ruddy breast reflected from the pool beneath, his long dagger-like bill pointed downwards, and his eye intent on the minnows that swarm among the roots of the old tree that project into the water from the crumbling bank. He stoops, opens his wings a little, shoots downwards, plunges

headlong into the water, reappears in a moment, flutters, sweeps off in a curved line, wheels round, and returns to his post. The minnow in his bill he beats against the decayed stump until it is dead, then tossing up his head, swallows it, and resumes his ordinary posture, as if nothing had happened. Swarms of insects flutter and gambol around, but he heeds them not. A painted butterfly at length comes up, fluttering in its desultory flight, and as it hovers over the hyacinths, unsuspicious of danger, the Kingfisher springs from his perch, and pursues him, but without success. There, swift as the barbed arrow, darting straight forward, on rapidly moving pinions, gleams his mate, who alights on a stone far up the stream, for she has seen us, and is not desirous of our company. He presently follows, and our watch being ended, we may saunter a while along the grassy slopes, inhaling the fragrance of the primrose, and listening to the joyous notes of the Blackbird, that from the summit of yon tall tree pours forth his soul in music.

It is chiefly by the still pools of rivers and brooks that the Kingfisher is met with. Although not plentiful in any part of the country, nor anywhere gregarious, it is generally dispersed in England, and occurs in the southern and part of the middle division of Scotland, but has not, I believe, been met with beyond Inverness, for the Kingfishers, so called, of the north, are merely Dippers. It remains with us all the year, shifting its station on the streams, and in summer selecting some place having a steep bank, in a hole in which it deposits its eggs. I have once only seen the nestling place of this bird: it was a large hole, among the roots of a tree on the bank of the Water of Leith, and in the neighbourhood of numerous burrows of the water-rats. My friend Mr Weir however writes me thus: "In July 1836, in a bank of sand upon the Water of Leith, I discovered a hole in which they bred. It was about twelve feet above the level of the river. The roots of a large beech tree hung like a network in front of it, and kept it from being seen. The hole was two feet three inches in length from the orifice, sloping upwards, being narrow at the entrance, but widening in the interior, and rounded at the extremity, in order to give the birds room to turn. Upon the

floor of it the moist and fetid pellets of fish-bones were strewed in all directions. It appeared to have been inhabited for two or three years. The old birds were exceedingly shy. If any one made his appearance within sight of their abode, they would not go near it. Young birds in general, when their parents are absent, do not utter the slightest note until they return. With these Kingfishers however this was not the case, for had it not been owing to their loud and incessant chirping for food, the nest would not, in all probability, have been discovered. But whether this is a general characteristic of the species, I have not had the means of ascertaining. As they became ripe, they were very voracious, and not easily satisfied. They were six in number, and continued a long time in their abode, before they took to flight. They usually sat at the mouth of the hole when they received food, in the same way as the sand martins, when they are nearly fledged.

"In July last, I saw a male and a female Kingfisher with four young ones about eight days old, which were taken out of a hole about two feet in depth, in a sand bank upon the river Calder, at a short distance from Douglass Park, in the parish of Bothwell, Lanarkshire. The brood, according to report, had been sitting upon sand intermixed with a small quantity of the fibrous roots of trees, and surrounded by the pellets of fish-bones."

Mr Henry Turner states in Loudon's Magazine, Vol. IV, p. 450, that at Bury St Edmund's in Suffolk "some boys watched an old one into a hole in the bank of the river Lark, and attempted to capture it on its exit; but without success in this case. They then with a crooked stick pulled out a portion of the nest, consisting of a few feathers, old dried roots, and hay. I subsequently examined the hole," he continues. "It was in a low meadow 300 yards east of Northgate Street, and on the bank of a small stream. The entrance to the hole was about three feet from the water, and one foot beneath the level of the meadow. Hole nine inches in diameter, and about five feet in length; straight, and somewhat larger at the end than at the entrance." Various other individuals have alleged

that the nest is formed of dry grass, roots, and feathers; but Montagu gives a different account of it.

"The hole chosen to breed in is always ascending, and generally two or three feet in the bank; at the end is scooped a hollow, at the bottom of which is a quantity of small fish-bones, nearly half an inch thick, mixed in with the earth. This is undoubtedly the castings of the parent birds, and not of the young, for we have found it even before they have eggs, and have every reason to believe both male and female go to that spot for no other purpose than to eject this matter for some time before the female begins to lay, and that they dry it by the heat of their bodies, as they are frequently known to continue in the hole for hours long before they have eggs. On this disgorged matter the female lays to the number of seven eggs, which are perfectly white and transparent, of a short oval form, weighing about one dram. The hole in which they breed is by no means fouled by the castings; but before the young are able to fly it becomes extremely fetid by the fœces of the brood, which is of a very watery nature, and cannot be carried away by the parent birds, as is common with most of the smaller species. In defect of which instinct has taught them to have the entrance to their habitation ascending, by which means the filthy matter runs off, and may frequently be seen on the outside. We never could observe the old birds with any thing in their bills when they went in to feed their young; from which it may be concluded they eject from their stomach for that purpose."

This account of the nest however is very improbable, and accordingly Mr Rennie, in his edition of Montagu's Dictionary, doubts its accuracy. "In the bank of a stream, at Lee in Kent, we have been acquainted with one of these nests in the same hole for several successive summers, but so far from the exuviæ of fish-bones ejected, as is done by all birds of prey, being dried on purpose to form the nest, they are scattered about the floor of the hole in all directions, from its entrance to its termination, without the least order or working up with the earth, and all moist or fetid. That the eggs may by accident be laid upon portions of these fish-bones is highly probable,

as the floor is so thickly strewed with them, that no vacant spot might be found, but they assuredly are not by design built up into a nest. The hole is from two to four feet long, sloping upwards, narrow at the entrance, but widening in the interior, in order perhaps to give the birds room to turn, and for the same apparent reason the eggs are not placed at the extremity. I am not a little sceptical as to its sometimes selecting the old hole of a water-rat, which is the deadly enemy to its eggs and young; but it seems to indicate a dislike to the labour of digging. It frequents the same hole for a series of years, and will not abandon it, though the nest be repeatedly plundered of the eggs or young."

In the second volume of the Naturalist, p. 274, Mr Allington gives the following account of it: "A friend of mine while fishing on a small trout-stream, near Louth, called the Crake, in the early part of June, observed a Kingfisher, with a fish in its mouth, flying several times near his hat with a whirring noise. He watched it until it entered a hole in the bank, the entrance to which was strewed with fish bones. On digging into the hole (which commenced low down in the bank, and ran upwards in a slanting direction for about two feet), he found the nest, containing seven young birds just hatched. The bottom of the nest was excessively thick, and mixed up with small bones of the stickleback. Its structure, excepting the mixture of fish-bones, was not very unlike that of a Thrush. It crumbled to pieces on being touched, and I could procure no portion worth preserving. Near the nest was another hole, which had all the appearance of having been the Kingfisher's last year's residence, the bones at the entrance being dry and crumbly; but in this the parent bird again commenced laying, and on opening the nest six eggs were found on the fragments of the structure. They were white, and beautifully transparent, shewing the yolk through, which gave them a pinkish hue at the larger end. I have now in my collection one of the eggs, which, though so transparent, I was surprised to find thicker and stronger than the generality of eggs, and rounder in its form, the circumference being two inches and a half, the length eight-tenths of an inch."

The question as to its nestling in a water-rat's hole can be decided only by actual observation. Its bill is certainly well adapted for digging into earth or sand, but its feet one might suppose would prove very inadequate instruments for scraping out the debris along a tunnel of three or four feet. On the other hand its hole is often at a greater height from the water than we ever find that of the water-rat; in the case of Mr Weir's above mentioned, it was twelve feet; and all accounts agree in describing it as straight and sloping upwards, whereas the holes of water-rats are usually tortuous. It is possible enough that sometimes the Kingfisher may take possession of a water-rat's hole, or even that of a common rat or mole, and enlarge it, as I have seen the Starling do in the islet of Copay in Harris with rats' holes; and that it may also dig a hole for itself, like the Bank Swallow. At all events, we have certain evidence that the American Kingfisher, Alcedo americanus (A. Alcyon of Linnæus) digs its hole. Mr Audubon states that "the male and female, after having fixed upon a proper spot, are seen clinging to the bank of the stream in the manner of Woodpeckers. Their long and stout bills are set to work, and as soon as the hole has acquired a certain depth, one of the birds enters it, and scratches out the sand, earth, or clay, with its feet, striking meanwhile with its bill to extend the depth. The other bird all the while appears to cheer the labourer, and urge it to continue its exertions; and, when the latter is fatigued, takes its place. Thus, by the co-operation of both, the hole is dug to the depth of four, five, or sometimes six feet, in a horizontal direction, at times not more than eighteen inches below the surface of the ground, at others eight or ten feet." The eggs are five or six in number, broadly ovate, pure white, eleven-twelfths of an inch in length, and nine-twelfths in breadth.

The flight of the Kingfisher is direct and rapid, performed by quick beats of the wings, and very similar to that of the Dipper, which it however excels in speed. The movements of the wings are indeed so rapid that one can scarcely perceive them, and the flight of this bird, the Dipper, Auks, and Guillemots, and other short-winged birds, might induce the closet-

naturalists to revise their opinions as to flight, founded merely upon the length and breadth of wings; for a long wing is not always so well adapted for speed as a short one, and a Guillemot can easily outstrip a Gull. Its feet are not adapted for walking or hopping, and therefore it takes its stand on a stone, a stump, a rail, or a branch overhanging the water, waits with patience, and when a minnow or a stickleback comes near the surface, darts upon it, and secures it. In like manner it sallies forth in pursuit of the larger insects. Although very shy, insomuch that one can very seldom get within shot of it when perched, it does not shun the vicinity of human habitations, but, on the contrary, often breeds at no great distance from them. It does not associate with any other birds, and it is seldom that even two of its own species are seen together. Being highly prized by collectors and others, it is much harassed, and although nowhere plentiful, may be obtained in almost any district to the south of the Forth and Clyde. In some places they leave the larger streams in autumn and betake themselves to the brooks, so that a person not aware of their habits in this respect might suppose them to be migratory. Even in the more northern parts, however, they remain all the year, and I have seen specimens shot near Edinburgh in December and January.

"In my neighbourhood," Mr Weir writes to me, "Kingfishers are never seen before the beginning of September, and they usually disappear about the end of March. They then retire to the river Avon, where they breed. In Bathgate and Boarbaughlaw Waters, they prefer those parts where the banks are covered with alders and willows. In severe winters they sometimes become so tame that they even venture within a few feet of the door of Bathgate Mill, which is situate in the immediate vicinity of houses. I have had opportunities at different times, during the month of March, in three successive seasons, of observing through an aperture in an old 'Galloway dyke,' situate about twenty-five feet from a rivulet in this parish, the habits of a male Kingfisher. His flight was very rapid, and in a straight and horizontal direction. Upon the top of an old wall, three feet in height, and at a short distance from the edge of the stream, or upon a small bough overhanging it, he usually perched,

sometimes remaining motionless for more than half an hour, anxiously watching his prey. He must have been uncommonly quick-sighted, for when he darted into the water, he always came up with a minnow in his bill, with which he instantly alighted on a stone or paling, and after killing it he swallowed it whole. He continued his fishing until it was almost dark, and before he went to roost he plunged into the stream several times, and in rapid succession."

The following account of its habits, as observed in the county of Leicester by Mr Harley, will, I think, render its history pretty complete. "The Kingfisher, which is a permanent resident with us, not only frequents our broadest rivers, as the Trent and Soar, but also our pools, fish-ponds, smaller brooks and rills, even as high as their sources. From what I have now stated, you will hardly judge it necessary for me to enter my protest against the assertion made by the author of the 'Ornithologia,' relative to this bird and its proximity to the habitations and works of man. A few minutes' walk from hence by our river's side, will satisfy the most scrupulous observer that the Kingfisher is not merely a bird of the wild, confined to the banks of streams remote from cities. This bird feeds, and nestles too, near the habitations and in hearing of the hum of men. One feeding spot which it apparently delights to frequent, is immediately below our castle, where some old pollard willows hang over the river, and not more than two hundred yards from one of the churches.

"The flight of the Kingfisher is direct, rapid, and impetuous, and is performed with very quick beats of the wings. When it is about feeding, it will suspend itself over its finny prey after the manner of the Windhover, Whinchat, and Robin. It is a true plunger, and in this respect is nearly allied to the Gull and Tern families. Of its voracity I have had abundant evidence.

"In January 1831, I accompanied a friend, an old sportsman, to the flat lands of Loughborough, in quest of wild fowl. The day was unusually frosty, much snow lay on the ground, the brooks, canals, and rivers were completely frozen up, and the feathered tribes appeared to feel the full severity of winter. After a somewhat fruitless search, we began to retrace our steps,

and leaving the banks of the Soar, in order to regain the upland, proceeded along the margin of a brook that rises in the forest of Charnwood, and joins the Soar at Loughborough. We had not made many paces from the confluence of these streams, when we saw a Kingfisher hovering over the middle of the stream, which at this point was not frozen over. It hovered, plunged, brought up its prey, and in an instant was on wing. We made a double of the brook, when the bird passing us like a meteor, my friend fired; but the bang, bang, of Joe Manton's two barrels told not. Redoubling our pace, and crossing the angles of the brook in different directions, we again came within shot, when my friend fired, and missed. The bird passed us like an arrow fully barbed, retained its prey in its mandibles, and in an instant was out of reach.

"The Kingfisher suffers much from severity of weather. In the extremely rigorous winter of 1838, in the months of January and February, many were found dead on the banks of our river, and several of them came under my notice. I have yet to learn whether any partial migration goes on in the brumal months. In these parts Kingfishers abound, and I have every reason to believe that their numbers are never diminished by this cause, whatever may be supposed by persons whose knowledge of the habits of birds is derived from books. This bird has a shrill and piercing note, which it emits when on wing, and which is different from that of any other British bird with which I am acquainted. How much better it would be for writers on natural history to speak positively, when they can do so, than doubtfully! Mr Yarrell states that 'it is *said* to have a shrill piping note,' and if he never heard it, he does well; otherwise the information is not satisfactory.

"Towards the beginning of May the Kingfisher begins to prepare a place for its eggs, and in June the young come abroad. The female makes no nest whatever; at least, in the breeding-places which I have examined, I have never discovered any such materials as straws, or moss, or weeds. The eggs, five, six, or seven in number, roundish, and perfectly white, are deposited at the upper end of a rat's hole, generally in the bank of a stream, or fish-pond. The hole which has

been selected, generally contains large quantities of fish bones, which are castings. They lie scattered irregularly, and can scarcely be called the nest, although the bird deposits her eggs upon them, and the young are reared in the same situation. Rennie makes the Kingfisher a miner ; but I have never seen it digging. The nesting-places which I have inspected had no hollow scooped out for the fish bones, or castings, but the bones were strewn without any order, from the mouth of the hole to the place where the eggs or young were. The Kingfishers will use the same holes from year to year ; and this even if their nests have been plundered. Last year, we had one near the town, but from the frequent floods which happened in June, the young never came abroad. I have seen both birds entering their breeding places in May and June, and therefore I think that the male may assist in feeding the female during the process of incubation, and the young also while they are helpless, and before they come abroad."

Young.—According to M. Temminck, "the young have the upper parts of a very deep bluish-green ; the lower parts of a yellowish-red ; the bill black ; the iris of a very dark brown ; the feet flesh-colour, shaded with blackish."

Genus II. Ceryle.

Family II. Meropinæ.

1. Linn.
Genus II. MEROPS. BEE-EATER.

Bill longer than the head, somewhat arched, opening to beneath the middle of the eye, pentagonal at the base, then four-sided, compressed, and tapering to a point: upper mandible with the dorsal outline arcuate, the sides sloping and slightly convex, the ridge carinate, the edges sharp, at the base overlapping, the tip acute and destitute of notch; lower mandible with the angle short, the dorsal line slightly arcuate, the ridge narrow, the sides somewhat convex, the tip acute; the gape-line arcuate.

Palate flat; posterior aperture of nares oblongo-linear; upper mandible concave, with three prominent lines; lower more deeply concave, with a prominent median line. Nostrils broadly elliptical or roundish, in the fore part of the short nasal membrane, which is covered with short feathers directed backwards. Eyes of moderate size; eyelids feathered. External aperture of ear roundish, of moderate size.

Feet remarkably small and feeble; the tibia bare above the joint; the tarsus extremely short, roundish; its scales indistinct. Toes very slender; the hind toe proportionally small, beneath broad and flattened; the anterior toes parallel, the inner little shorter than the outer, and free beyond the second joint; the third not much longer than the fourth, with which it is united to more than half its length; the scutella distinct. Claws curved, slender, much compressed, very acute, those of the second and third toes with dilated inner edges.

Plumage generally blended, but rather firm and glossy; the feathers oblong. Wings long, pointed, very broad; the quills twenty-three, the primaries much longer than the secondaries; the first quill extremely small, the second longest; the secon-

daries emarginate. The tail long, of twelve feathers, of which the two middle are generally much longer and pointed.

The Bee-eaters, which are of a more elongated form than the Kingfishers, and for the most part gaudily coloured, belong to the warmer regions of the Old Continent and its islands. They feed upon insects, have a rapid and buoyant flight, and generally nestle in holes. One species visits this country at irregular intervals.

Linn.

1. MEROPS APIASTER. THE YELLOW-THROATED BEE-EATER.

COMMON BEE-EATER.

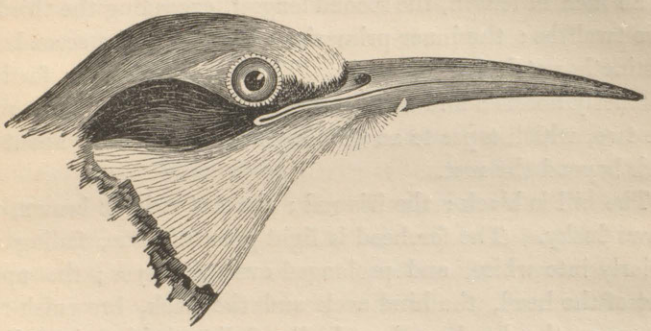


Fig. 276.

Merops Apiaster. Linn. Syst. Nat. I. 182.
Merops Apiaster. Lath. Ind. Orn. I. 269.
Merops chrysocephalus. Lath. Ind. Orn. I. 273.
Common Bee-eater. Mont. Orn. Dict.
Guepier vulgaire. Merops Apiaster. Temm. Man. d'Orn. I. 420.
Common Bee-eater. Merops Apiaster. Selb. Illustr. I. 114.
Merops Apiaster. Common Bee-eater. Jen. Brit. Vert. An. 156.

Upper part of head, hind-neck, and part of the back, brownish-red, that colour fading into yellow on the rump and scapulars; forehead pale blue; loral space and a band behind the eye black; throat rich yellow, that colour bounded by a band of black, the lower parts light green.

Male.—The Common or Yellow-throated Bee-eater is of a rather slender and elongated form; with the neck short, the head ovate and rather large; the bill long, slender, tapering, slightly arched, and pointed; the feet very diminutive, with the lower part of the tibia bare, the tarsus extremely short, with indistinct scales; the hind toe very small, the rest parallel, in-

capable of spreading, the inner being adherent for nearly half, and the outer for about two thirds of its length, the first with eight, each of the rest with about sixteen scutella ; the claws rather long, decurved, much compressed, laterally grooved, acute.

The plumage is rather firm and glossy, but blended ; the feathers ovate, with the filaments separated. The wings long and pointed ; the first quill slender and pointed, nine twelfths of an inch in length, the second longest, exceeding the third by two twelfths ; the inner primaries and most of the secondaries distinctly notched at the end. The tail is long, the feathers distinctly notched and nearly of equal length, except the middle two, which taper to an obtuse point, and extend about an inch beyond the rest.

The bill is black ; the iris red ; the feet reddish-brown, the claws dusky. The forehead is light greenish-blue, fading anteriorly into white, and prolonged over the eyes ; the upper part of the head, the hind-neck and the back, brownish-red, deeper on the head, and gradually fading behind into light yellowish-brown, of which colour are the scapulars and rump, of which however the tips incline to pale greenish-blue. The wing-coverts are greenish-blue ; but on the wing is a patch of brownish-red, formed by some of the small coverts, and the outer webs of some of the secondary coverts, and secondary quills. The primary quills and coverts are greenish-blue, with the inner webs duller, dusky, and becoming brownish-black at the end ; the secondary quills are brownish-red on both webs, brownish-black toward the end, with a little greenish-blue on the outer margin ; the inner quills chiefly greenish-blue. The upper tail-coverts are bluish-green ; the tail-feathers similar, with part of the inner webs of all except the middle two, brown. The loral space, and a band below and behind the eye, are black ; the throat is rich yellow, margined under the eyes with pale greenish-blue, and terminated behind by a band of black ; beyond which, the lower parts are verdigris green, or light bluish-green ; the lower wing coverts and part of the lower surface of the quills, pale reddish ; the rest of the lower surface of the wings and the tail greyish-brown.

Length to end of tail $10\frac{3}{4}$ inches; bill along the ridge $1\frac{5}{12}$, along the edge of lower mandible $1\frac{1}{12}$; wing from flexure $5\frac{1}{12}$; middle tail-feathers $4\frac{1}{12}$; tarsus $\frac{1}{2}$; hind toe $\frac{3}{12}$, its claw $\frac{2}{12}$; second toe $\frac{5}{12}$, its claw $\frac{2}{12}$; third toe $\frac{6}{12}$, its claw $\frac{4}{12}$; fourth toe $\frac{6}{12}$, its claw $\frac{2}{12}$.

Female.—In the female, the tints are not so rich, the hind part of the back is tinged with green, the yellow on the throat is paler, and the dark band on the side of the head is tinged with brown; but the differences are not conspicuous.

Habits.—This species of Bee-eater is said to be extensively distributed in Africa, whence it passes in small flocks into the countries along the northern shores of the Mediterranean, some individuals proceeding into Switzerland, France, and Germany. It is also common in the Archipelago, Turkey, and the southern parts of Russia. In England it has several times been met with in Cornwall, Devonshire, Hampshire, Surrey, Suffolk, Norfolk, and a few other counties. Mr Thompson of Belfast states that he "saw an individual in a recent state, that was shot on the 6th of October 1832, by Capt. James M'Dowall, at his seat, near the Mull of Galloway." The same gentleman mentions a few instances of its occurrence in Ireland.

The various particulars relative to its habits that I have been able to glean are as follows. It is gregarious in its migrations, and when circumstances are favourable, breeds in numbers, perforating the clayey banks of the Don and Wolga, to the depth of half a foot. The nest is formed of moss, and the eggs, from five to seven in number, are of a roundish form, about an inch in length, of a pure glossy white. They feed upon insects, especially bees, which they pursue much in the manner of swallows; their flight being rapid, and light, but less devious or wavering than that of these birds, and when on wing they utter a rich warbling chirp.

Young.—According to M. Temminck, "the young have the upper parts of a greenish-brown; above the eyes a red

band; the throat of a dull yellow, without the black half-collar; all the feathers of the tail of equal length; the bill shorter and weak; and the iris rose-coloured."

Fam: III. Coracina. p.

I have now examined and described the entire series of the Land Birds, so called, with the exception of two species, which have been omitted in their proper places. A considerable amount of interesting information respecting the habits of many of the species has also been recently obtained by me. I have thus found it necessary to subjoin a Supplement, containing the omitted birds, and an Appendix supplying additions to the history of the species described in the first three volumes.

SUPPLEMENT,

CONTAINING OMITTED SPECIES.

LOXIA LEUCOPTERA. THE WHITE-WINGED CROSSBILL.

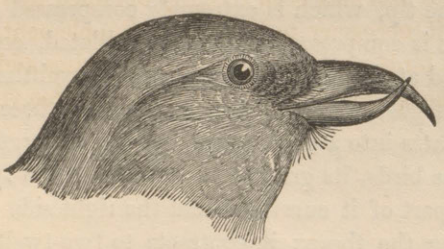


Fig. 277.

Loxia leucoptera. Gmel. Syst. Nat. I. 844.
Loxia falcirostra. Lath. Ind. Orn. I. 371.
Bec-croisé leucoptère. Loxia leucoptera. Temm. Man. d'Orn. III. 243.
Loxia leucoptera. White-winged Crossbill. Jen. Brit. Vert. An. 143.

Length about six and a half inches; mandibles extremely compressed toward the end; wings black, with two transverse white bands. Male bright crimson above and beneath. Female dusky tinged with yellow above, the rump wax-yellow, the lower parts yellowish-grey, longitudinally streaked with dusky. Young like the female, but with less yellow.

Male.—This species, of which a very few individuals have been procured in Britain, is distinguished from the rest by its extremely compressed bill, and the two broad bands of white on its wings, both characters being so remarkable that one of

its first describers named it the Sickle-billed, and the other the White-winged Crossbill. It is inferior in size to the common species, and somewhat less robust, but otherwise similar in form ; its head being large and broadly ovate ; the eyes small ; as are the nostrils, which are round, and concealed by short bristly plumelets. The bill is rather long, higher than broad even at the base, extremely compressed toward the end, with the mandibles laterally deflected so as to cross each other, as in the common species ; the upper mandible with the dorsal outline convex and declinate, the sides little convex, the margins united toward the end, so as to form a single cutting edge, the tip extremely thin and much elongated ; the lower mandible with the dorsal line convex and ascending, the edges approximated at the tip, which is extremely compressed and pointed. The tongue is compressed at the base, dilated, concave above, and rounded at the end ; its length three twelfths and a half. The œsophagus, which is two inches and three quarters in length, dilates into a crop proportionally as large as in most gallinaceous birds, its greatest breadth being ten-twelfths of an inch, and part of it curving round the right side of the neck. On entering the thorax it contracts to two-twelfths, and, as usual, terminates in a bulbiform proventriculus. The stomach is of rather small size, but muscular, being a roundish gizzard, five-twelfths in length, six-twelfths in breadth, with a dense, longitudinally rugous, reddish epithelium. The intestine is of moderate length and width, measuring ten inches and a half, with an average breadth of two-twelfths. The cœca are little more than a twelfth in length, and an inch and two-twelfths distant from the extremity of the rectum, which is dilated into an oblong cloaca.

The feet are rather short and strong ; the tarsus short, with seven scutella ; the toes moderate, the first strong, the lateral nearly equal ; the pads and papillæ large as in the other species ; the claws long, arched, much compressed, and pointed.

The plumage is blended. The wings of moderate length, and pointed ; the first and second quills longest, the third little shorter ; the secondary quills somewhat emarginate. The tail is deeply emarginate, of ordinary length, and considerably divaricate.

The bill is dusky; the iris brown; the feet deep reddish-brown. The general colour of the plumage is bright crimson; but the feathers on the fore part and middle of the back are blackish-brown unless on the edges; and the scapulars, wing-coverts, quills, upper tail-coverts, and tail, are black. The first row of small wing-coverts, and the terminal half of the secondary wing-coverts, are white, forming two conspicuous bands; the quills are slightly margined and the inner secondaries tipped with white; the tail-feathers are similarly edged, and their coverts tipped with the same. The feathers at the base of the bill are yellowish-white; the sides of the body are tinged with brown, and streaked with dusky; the axillar feathers whitish; and the lower tail-coverts brownish-black, margined with pale red.

Length to end of tail $6\frac{4}{12}$ inches; extent of wings $10\frac{1}{2}$; bill along the ridge $\frac{8\frac{1}{2}}{12}$, along the edge of lower mandible $\frac{7}{12}$; wing from flexure $3\frac{1}{2}$; tail $2\frac{1}{2}$; tarsus $\frac{7\frac{1}{2}}{12}$; hind toe $\frac{3\frac{1}{2}}{12}$, its claw $\frac{5}{12}$; second toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; third toe $\frac{5}{12}$, its claw $\frac{5}{12}$; outer toe $\frac{4\frac{1}{2}}{12}$, its claw $\frac{5}{12}$.

Female.—In the female the feathers of the upper parts are blackish-brown, margined with greyish-yellow; the rump wax-yellow; the lower parts yellowish-grey, longitudinally streaked with dusky, the fore part of the breast wax-yellow; the wings and tail as in the male, but with the white markings less extended.

Length to end of tail $6\frac{2}{12}$ inches; extent of wings 10.

Habits.—Dr Richardson states that in North America this species "inhabits the dense white spruce forests of the fur countries, feeding principally on the seeds of cones. It ranges through the whole breadth of the continent, and probably up to the sixty-eighth parallel, where the woods terminate, though it was not observed by us higher than the sixty-second. It is mostly seen on the upper branches of the trees, and, when wounded, clings so fast, that it will remain suspended after death. In September it collects in small flocks, which fly from tree to tree, making a chattering noise; and in the depth

of winter it retires from the coast to the thick woods of the interior." Mr Audubon informs us that its "habits are in general similar to those of our common species. Its song is at times mellow and agreeable, and in captivity it becomes gentle and familiar."

M. Temminck states that it is occasionally met with in Europe, "singly or in small flocks. It has several times been taken in the north of Germany and elsewhere, and has been killed at Nuremberg and in England." In the latter country it has been obtained in a very few instances, as appears from the following notice which I extract from Mr Yarrell's most valuable History of British Birds. "H. E. Strickland, Esq. of Cracombe House, Evesham, mentions that he possesses a specimen killed near Worcester in 1836; and Mr Hoy informs me that some years ago Mr Seaman of Ipswich, who is well acquainted with birds, being out with his gun, looking for specimens, saw five or six small birds on a tree, which from their peculiar manners attracted his attention; he fired and killed one, which proved to be a White-winged Crossbill." A female is also stated to have been shot within two miles of Belfast in January 1802.

Whether these European birds are precisely identical with those of North America, I cannot from my own observation say; but the descriptions of authors would induce us to believe that they are. Mine have been taken from American specimens, for which I am indebted to Mr Audubon.

Young.—The young birds in their first plumage differ little from the female.

CALAMOPHILUS. PINNOCK.

Bill short, rather slender; upper mandible with the dorsal outline considerably convex, the sides also convex, the edges thin, nearly direct, arched toward the end, without notch, the tip narrow, declinate; lower mandible with the angle rather narrow, the dorsal line almost straight, the edges inflected, the tip narrow. Tongue slender, trigonal, obliquely truncate and lacerate; œsophagus enlarged into a kind of half-crop inclined toward the right side; stomach muscular, with a dense rugous epithelium; intestine of moderate length; cœca very small.

Head ovate, of moderate size; nostrils small, round, concealed by bristly plumelets directed forwards; eyes of moderate size; aperture of ear roundish and rather large; neck short; body rather slender; feet of moderate length; hind toe stout, lateral toes about equal; claws rather long, arched, compressed, acute.

Plumage very soft, blended. Wings short, rounded; the first quill extremely small, being scarcely apparent, the second not much shorter than the third and fourth, which are longest. Tail very long, graduate, of twelve weak rounded feathers.

The examination of the digestive organs of the only known species of this genus at once determines its natural affinities, shewing that, having the kind of dilatation of the œsophagus peculiar to the Huskers, it must be referred to that group, although it has hitherto been considered as closely connected with the Tits.

CALAMOPHILUS BIARMICUS. THE BEARDED PINNOCK.

BEARDED TITMOUSE. BEARDED TIT. LEAST BUTCHER-BIRD.



Fig. 278.

Parus biarmicus. Linn. Syst. Nat. I. 342.
Parus biarmicus. Lath. Ind. Orn. II. 570.
Bearded Titmouse. Mont. Orn. Dict.
Mesange barbue ou moustaché. Temm. Man. d'Orn. I. 298.
Bearded Titmouse. Parus biarmicus. Selb. Illustr. I. 244.
Calamophilus biarmicus. Jen. Brit. Vert. An. 125.

Male with the head light greyish-blue, the general colour light red; the wings variegated with black and white; mystachial bands and lower tail-coverts black. Female lighter, with the head merely tinged with grey, no mystachial bands, and the lower tail-coverts light red. Young like the female, but with the head and back black.

Male.—This elegantly formed and delicately coloured bird is somewhat less robust, and more elongated, than the Reed Bunting. The head is ovate, and of moderate size; the neck short; the body rather slender; the feet of ordinary length; the tarsus slender, with seven anterior scutella; the hind toe stout, with six, the second with nine, the third with twelve,

the fourth with eleven scutella; the claws moderately arched, rather long, slender, much compressed, laterally grooved, acute. The bill is short, somewhat conical, rather slender; the upper mandible with its dorsal line convexo-declinate, the sides convex, the edges a little inflected about the middle, the tip narrow; the lower mandible with the angle rather narrow, the dorsal line very slightly convex, the edges considerably involute, the tip narrow.

The tongue is slender, trigonal, tapering, flat above, sagittate and papillate at the base, at the end obliquely truncate, slit, with several thickish filaments, its length four and a half twelfths. Œsophagus one inch two-twelfths long, inclined to the right, with a distinct dilatation or crop a quarter of an inch in width; the proventriculus bulbiform. Stomach a very muscular gizzard, six and a half twelfths long, seven-twelfths broad, obliquely placed, with the lateral muscles very prominent, the epithelium dense, with broad rugæ, and of a yellowish colour, the right muscle two-twelfths thick. Intestine only five and a half twelfths long, of moderate width; the cœca a twelfth and a quarter long. In another individual, the œsophagus an inch and three-fourths in length; the stomach half an inch long, seven-twelfths in breadth; the intestine seven inches and a quarter long. In another the intestine is eight inches and three-fourths in length. The trachea as in the Passerinæ and Cantatores; its rings sixty.

The plumage is very soft and blended. The nostrils, which are roundish, are concealed by soft reversed plumelets. From the angle of the mouth on each side there proceeds downwards a tuft of elongated lanceolate feathers. The wings are short, convex, somewhat rounded; the first quill very slender, tapering, five-twelfths of an inch long; the second three and a half twelfths shorter than the third, which is slightly shorter than the fourth; the secondary quills of moderate breadth and rounded. The tail is very long, much graduated, of twelve slightly arched, weak, rounded feathers, of which the lateral is an inch and ten-twelfths shorter than the longest.

The bill is pale brownish-yellow; the iris orange; the feet and claws black. The head and neck are of a delicate bluish-

grey; the general colour of the upper parts is light red; the smaller wing-coverts black; the quills dusky with a tinge of grey, the outer margins of the primaries greyish-white, those of the secondaries light red; the inner secondaries with a black stripe on the outer web, and the inner mostly white, with a reddish tinge. The outer feather of the tail is black in its basal half, white in the rest; the next two on each side with the outer webs white, and the inner reddish-white; the rest of the same colour as the back. The throat is greyish-white; on each side of it, proceeding from the base of the bill, and including the elongated feathers, a black mystachial band, whence the specific name of the bird; the fore-neck pale grey, that colour gradually passing into light red, which is the prevailing tint on the lower parts; the abdomen lighter; the lower tail-coverts pure black.

Length to end of tail $6\frac{1}{2}$ inches; extent of wings $7\frac{1}{4}$; bill along the ridge $\frac{4\frac{1}{2}}{12}$, along the edge of lower mandible $\frac{5\frac{1}{2}}{12}$; wing from flexure $2\frac{1}{2}$; tarsus $\frac{9\frac{1}{2}}{12}$; hind toe $\frac{3}{12}$, its claw $\frac{3\frac{1}{2}}{12}$; second toe $\frac{5}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; third toe $\frac{6\frac{1}{2}}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; fourth toe $\frac{5}{12}$, its claw $\frac{2\frac{1}{2}}{12}$.

Female.—The female is somewhat smaller than the male, and wants the elongated mystachial feathers. The colours are as in the male, but of a paler tint; the head pale reddish-grey; the outer three tail-feathers on each side with their bases dusky; and the lower tail-coverts light red like the sides.

Length to end of tail $6\frac{1}{4}$ inches.

Habits.—The Bearded Pinnock, which is extensively dispersed over the continent, inhabiting the marshy borders of rivers, but not extending northward beyond the Baltic, occurs in England chiefly along the Thames, and in the counties of Cambridge, Norfolk, Suffolk, and Lincoln. Its residence is among the reeds and other aquatic plants that margin the streams and pools, where it is little subject to observation. They cling to the stems, in all imaginable postures, often with the head down, climbing and descending with equal ease,

and when disturbed betake themselves to the ground or the lower parts of the plants, where they creep and skulk in the manner of the Reedlings. Their flight is quick and undulated, but they are seldom seen proceeding to a distance, the flocks, as observed by a writer in the Magazine of Natural History, "just topping the reeds in their flight, and uttering in full chorus their sweetly musical note. It may be compared to the music of very small cymbals, is clear and ringing, though soft, and corresponds well with the delicacy and beauty of the form and colour of the birds." This circumstance indicates their greater affinity to the Passerine birds than to the Tits, and the same may be said of their mode of feeding. During the autumn and winter they live chiefly on the seeds of the reeds, which they pick from the husks; but they also, as is related by Mr Dykes, feed upon Succinea amphibia and Pupa muscorum, he having found "the crop of one, which was not larger than a hazel nut, containing twenty of the former and some of them of a good size," together with four of the latter. Now, none of the Parinæ, nor indeed any bird of the whole order of the Cantatores, has a crop, which on the other hand occurs in a greater or less degree of development in all the Deglubitores. The nest of this bird, according to Mr Hoy, "is composed on the outside with the dead leaves of the reed and sedge, intermixed with a few pieces of grass, and invariably lined with the tops of the reed, somewhat in the manner of the nest of the Reed Wren. It is generally placed in a tuft of coarse grass or rushes near the ground, on the margin of the dikes, in the fen; but also sometimes fixed among the reeds that are broken down, but never suspended between the stems." The eggs, five or six in number, are eight and a half twelfths in length, six and three-fourths in breadth, white, with a few light red lines and dots.

Young.—When fledged, the young have the upper parts of a very pale light red, the lower much paler, with the fore-neck approaching to white. The upper part of the head and the middle of the back are patched with black in longitudinal streaks; the wings and tail nearly as in the female.

Remarks.—The only known species of this genus has by most authors been referred to that of the Tits, and by the rest considered as intimately allied to them; but the examination of its bill, tongue, and digestive organs has induced me to place it in connexion with the Passerinæ. In some respects it is distantly allied to Emberiza Schœniclus; but its more direct affinities are, I think, to the species of the American genera Ammodramus, whose mode of life is very similar. Its affinity to the Tits is very remote, and, although I have been censured for pointing out errors, I cannot allow such an association to remain undisturbed. The bird in question has not the abrupt, bristle-tipped tongue of a Tit, and its œsophagus is dilated toward the right side, as in all the birds which I have referred to the order of Huskers.

APPENDIX.

ADDITIONAL OBSERVATIONS

RELATIVE TO THE

BIRDS DESCRIBED IN THE FIRST, SECOND, AND THIRD VOLUMES.

COTURNIX DACTYLISONANS. COMMON QUAIL. Vol. I, p. 233.

Mr Hepburn informs me that the Common Quail was seen by him in East Lothian, on the 29th of May 1839. "Till then," he adds, "I had never heard its call-note, which I imitated so successfully as to decoy two different birds within six feet of the place where I was standing. Although I nearly struck one of them with a stick, it returned in the course of half an hour. They might easily be shot, as they raise up their head when advancing toward you. A friend informs me that they are by no means rare in the parishes of Dirleton and Athelstaneford. In the middle of September 1833, I saw several quails that were shot in the meadows of the Clyde, in the upper ward of Lanarkshire."

COLUMBA PALUMBUS. RINGED DOVE. Vol. I, p. 259.

The following note is from Mr Hepburn: "A man well advanced in life informs me that, fifty years ago, the boy who

discovered a Cushat's nest was looked up to by his fellows for the rest of the season. A friend states that during a long snow-storm that occurred in the end of the last century, one of these birds was seen in a cottage garden near Dirleton, feeding on greens: a circumstance of such rarity that most of the people on the farm went to look at it. Now, the Cushats are found in vast abundance in all the cultivated parts of the country. I have attentively considered the cause of this great increase, and venture to assign the following reasons: 1*st*. The great increase in the cultivation of clover and turnips, which afford them a certain supply of food during winter; and 2*dly*. The great increase of fir woods, which are their delight, both for roosting and for rearing their young. Where spruce-trees abound, their nests may be seen on every tree. The female sits close, and the male sometimes takes her place. When the young are pretty well grown, it is easy to kill the old birds, by selecting a place on some wooded bank, whence one can command the greatest number of tree-tops. Remaining quiet until some arrive, you embrace the first opportunity of shooting one. The report of the gun rouses the other birds, but in a few minutes more arrive, and one may shoot away for an hour or two. This may be cruel sport, but the destruction of these birds is in a manner necessary, especially as our peasant boys are prohibited from entering the woods to obtain their eggs or young.

"The Cushats fly to their feeding-places singly or in small parties; and, when searching for their companions, frequently display the most elegant risings and fallings in the air. They either alight abruptly, or fly round the spot two or three times. When they have no young demanding their attention, they spend the middle of the day in washing, basking in the sun in fallow fields, or sitting upon trees. About four o'clock they recommence feeding, and about six retire. From the beginning of autumn to the end of the year they subsist on such grain as can be procured in the fields. A few individuals will occasionally frequent the stack-yard at all seasons. When the stubble-fields are all ploughed, they subsist entirely on the leaves of the turnip and clover. I have heard people aver that they even attack the roots. In March, when the fields are sown,

they obtain a supply of grain, from which time till the ripening of the corn, they subsist on the leaves of the wild mustard, pea, and turnip, and are very destructive to the latter. They are very fond of wheat and oats, less so of barley, and devour beans, pease, and tares, with avidity. Wounded birds will roost in the trees near farm-yards, for the convenience of having food at hand.

"The Wood Pigeons ceased cooing on the 7th October 1839, and recommenced on the 18th of next February. They sometimes coo at night, when the moon shines."

COLUMBA TURTUR. TURTLE DOVE. Vol. I, p. 291.

In the summer of 1837, an individual of this species was shot near Haddington. Its dimensions were: Length to end of tail $11\frac{1}{4}$ inches; extent of wings 21; wing from flexure 7; tail $4\frac{1}{2}$; bill along the ridge $\frac{8}{12}$, along the edge of lower mandible $\frac{10\frac{1}{2}}{12}$; tarsus nearly $\frac{1}{12}$; first toe $\frac{6}{12}$, its claw $\frac{3}{12}$; second toe $\frac{8}{12}$, its claw $\frac{2\frac{1}{2}}{12}$; third toe $\frac{1}{12}$, its claw $\frac{3}{12}$; fourth toe $\frac{8}{12}$, its claw $\frac{2\frac{1}{2}}{12}$. On the tarsus were six scutella, on the hind toe six, the second nine, the third twelve, the fourth ten. The bill black, the bare space about the eyes deep red, the feet dark carmine, approaching to crimson, the claws dusky. The head and hind-neck light greyish-blue, as are some of the smaller wing-coverts, and the hind part of the back, but the latter tinged with brown, and the upper tail-coverts brown at the end. The scapulars, small wing-coverts, and some of the secondary coverts, and secondary quills, greyish-black, with broad yellowish-red margins. The quills and larger coverts with their outer webs brown, tinged with greyish-blue, the inner deep brown. The tail-feathers greyish-blue, the two middle brown toward the end, the rest tipped with white, and the lateral with its outer web white. The fore part of the neck lilac-purple. On each side of the neck a roundish patch of black feathers, each tipped with white. The lower parts are cream-coloured; the sides of the body, and the lower surface of the wings, light

greyish-blue; the lower tail-coverts white, the lower surface of the dark part of the tail-feathers greyish-black.

According to Sir William Jardine, in the Statistical Account of Applegarth and Sibbaldie, "The Turtle-Dove (Columba Turtur) was once shot in Jardine-Hall garden." In the Statistical Account of Steventon, in Ayrshire, one is stated to have been "shot in the parish three years ago" (that is, in 1835.)

CARDUELIS SPINUS. SISKIN. Vol. I, p. 400.

On the 27th December 1837, I saw three Siskins busily engaged in picking the seeds from the cones of an alder-tree, near Aberdour, in Fifeshire. They were so intent on feeding that they paid little regard to myself or my companion, who easily managed to shoot them all, although he obtained only one at a time. They clung to the twigs in the manner of the smaller Redpoll, hanging in various positions, and maintaining a perfect silence. After two of them had been shot, the third returned, and in seeking its lost companions uttered a very plaintive cry, resembling the syllables *twee, twee, twee*, much prolonged.

The digestive organs of a male were as follows: The upper mandible concave within, the lower very deeply concave; the palate arched. The tongue compressed, deep, tapering to a point. The œsophagus is an inch and ten-twelfths long, and has a distinct dilatation or crop, which lies on the right side, and when filled extends to the middle of the neck behind. The stomach is roundish, compressed, five-twelfths of an inch long, four and a half twelfths broad; and its muscles are distinct, although not remarkably strong. The intestine is five inches long; the cœca a twelfth and a half.

William

Mr Mactier informs me that in the end of April 1840, he found, in Kincardineshire, a nest containing young. It was attached to the forked branch of a larch.

PYRRHULA ENUCLEATOR. PINE BULLFINCH.
Vol. I, p. 411.

Through the kindness of Mr Audubon, who presented me with several specimens of this bird, I am enabled to add an account of its digestive organs. But as my description of them in the fourth volume of his Ornithological Biography is as perfect as I could make it, I here take the liberty of transcribing it. In an adult male, the roof of the mouth is moderately concave, its anterior part with five prominent ridges; the lower mandible deeply concave. Tongue 4½ twelfths long, firm, deflected at the middle, deeper than broad, papillate at the base, with a median groove; for the distal half of its length, it is cased with a firm horny substance, and is there of an oblong shape when viewed from above, deeply concave, with two flattened prominences at the base, the point rounded and thin, the back or lower surface convex. This remarkable structure of the tongue appears to be intended for the purpose of enabling the bird, when it has insinuated its bill between the scales of a strobilus, to lay hold of the seed by pressing it against the roof of the mandible. In the Crossbills, the tongue is nearly of the same form, but more slender, and these birds feed in the same manner, in so far as regards the prehension of the food. In the present species, the tongue is much strengthened by the peculiar form of the basi-hyoid bone, to which there is appended as it were above a thin longitudinal crest, giving it great firmness in the perpendicular movements of the organ. The œsophagus is two inches and eleven twelfths long, dilated on the middle of the neck so as to form a kind of elongated dimidiate crop, four twelfths of an inch in diameter, projecting to the right side, and with the trachea passing along that side of the vertebræ. The proventriculus is eight twelfths long, somewhat bulbiform, with numerous oblong glandules, its greatest diameter 4½ twelfths. A very curious peculiarity of the stomach is that in place of having its axis continuous with that of the œsophagus or proventriculus, it bends to the right nearly at a right angle. It is a very powerful gizzard, eight and a

half twelfths long, eight twelfths broad, with its lateral muscles a quarter of an inch thick, the lower very distinct, the epithelium longitudinally rugous, of a light reddish colour. The duodenum first curves backward to the length of an inch and a quarter, then folds in the usual manner, passing behind the right lobe of the liver; the intestine then passes upwards, and to the left, curves along the left side, crosses to the right, forms about ten circumvolutions, and above the stomach terminates in the rectum, which is eleven-twelfths long. The cœca are a twelfth and a quarter in length, and a quarter of a twelfth in diameter. The entire length of the intestine from the pylorus to the anus is thirty-one inches and a half (in another male thirty-one); its greatest breadth in the duodenum two-twelfths and a half, gradually contracting to a twelfth and a quarter. In a female, the œsophagus is two inches ten-twelfths long; the intestine thirty-one inches long. In all these individuals and several others, the stomach contained a great quantity of particles of white quartz, with remains of seeds; and in the œsophagus of one was an oat-seed entire. Although this bird is in its habits very similar to the Crossbills, and feeds on the same sort of food, it differs from them in the form and extent of its crop, in having the gizzard much larger, and the intestines more than double the length, in proportion to the size of the bird.

LOXIA EUROPÆA. EUROPEAN CROSSBILL. Vol. I, p. 417.

Mr J. M. Brown, who has paid much attention to the habits of birds, has favoured me with the following notice respecting this species. "The Crossbill, although not found in great numbers in any part of Scotland, remains with us during the whole year, and may be met with in small flocks of from eight to twenty or more individuals, among the pines of the midland and higher districts of the country. They feed most eagerly on the seeds extracted from the cones of the Scotch fir, larch, and spruce; and whilst thus occupied, they keep very quiet, and can be discovered only by the crackling noise made by their tearing open the cones with their powerful and curious

beaks, and the occasional dropping of the cones they have rifled. They always move from one part of the forest to another, at a signal given by one of the party that acts as leader, and is stationed on the summit of the tree. They manifest their desire to move by uttering a sharp loud note, and when the watchman observes any symptoms of impatience among those below, among the branches, he takes the lead in uttering his shrill note in a louder and more rapid manner than the others, for a few seconds, and on his taking wing the rest instantly let go the cones on which they have been operating, and accompany him, flying in a compact body, and uttering their note, as they fly along. They often take long flights, and frequently return to a neighbouring tree after making a few circuits. When feeding on the low branches of a tree, it is surprising how little fear they exhibit, even when approached so closely as to be almost within reach of the hand. Having slightly wounded one in the wing, I carried it home and placed it in a cage, with a quantity of larch cones, which it immediately attacked, without showing any symptoms of fear, and helped itself most plenteously. Shortly afterwards, however, it died; and this I attributed to my neglect in supplying it with water to drink. I have often endeavoured to find out the nests of these birds in the usual season, but never succeeded, and was surprised at last by discovering that their brood are all on the wing before their neighbours of the woods have set about preparing their nests. I was attracted one day in the end of February, during a heavy snow-storm, by the peculiar chirping of nestlings in the act of feeding; and on ascending the tree found five or six Crossbills almost fully feathered and quite vigorous, notwithstanding the severity of the weather, snugly huddled together in a nest composed of small twigs externally, and lined with matted wool. In mild seasons I suppose they breed, even in this country, in the month of January. They are not entirely destitute of song. I have often been delighted with a concert of these birds, perched on the sunny side of a tree. Although not loud, their song is pleasingly varied, a good deal resembling that of the Bullfinch, and not unlike that

of the Water-Ouzel, when you chance to overhear his gentle warbling, as he sits on a ledge of rock or ice, in a frosty day."

Mr Durham Weir, who has always exerted himself to the utmost in obtaining from personal observation such facts as were more especially required to give interest to these volumes, has also supplied me with the following remarks. "About the beginning of February 1839, I winged a female Crossbill, which is now in my possession, in good health, and very tame. It is an active and amusing bird, but at times rather annoying, from the loudness of its chirping. It is very mischievous. By means of its thick bill, which is furnished with very strong muscles, it has destroyed the framework of several cages. It inserts this powerful instrument between the scales of the cones of the different kinds of firs, opening them with ease, and with great dexterity takes out the seeds with its tongue, which is admirably fitted for that purpose. I have seen it with its bill lift up to its perch, which is nine inches from the bottom of the cage, cones of the spruce tree four inches in length, and two and a half in circumference, and there keep firm hold of them with its long and hooked claws, until it had extracted the seeds. What is still more remarkable, when the perches were removed a few inches higher up, it had the sagacity to carry the cones to the side of the cage, and raise them up endwise against the bars, before it attempted to seize them, which it afterwards did with its bill, when suspended head downwards by the claws. One might have been almost inclined to believe that it could calculate to a nicety the distance at which it was able to reach, and the strength required to raise the cones. Like the Parrot tribe, it climbs along the wires of the cage in different directions, by means of its bill and claws, and often opens the door of it, although I fix it with a piece of cord. When pleased, it utters a cry which has a strong resemblance to that of the Blackbird, when that bird is in a state of alarm. It feeds chiefly on hemp-seed, which it prefers to all other kinds of seeds. It seems likewise to be fond of walnuts, almonds, and filberts, the shells of which it easily splits with its bill, if a very small hole be previously made in

them. It occasionally eats the kernel of the cocoa-nut, and the crust of loaf-bread.

" For the period of ten years Crossbills had not made their appearance in this part of the country. In the beginning of September 1838, however, I observed a dozen of them feeding upon the seed of the larch, in a plantation near to Polkemmet House, the residence of Sir William Baillie, Bart., in the parish of Whitburn. To this place, for nearly six months afterwards, during the morning and forenoon, they almost daily resorted, and roosted every night in an old Scotch fir plantation, about a mile and a half distant. One afternoon, while I was watching them, they alighted upon the top of a tree, at a short distance from me. In a moment they crept into the thickest of the branches, and although a young man and I threw stones at them until we were tired, we only succeeded in expelling one of them from their roosting place. As it was nearly two hours before their usual time of retirement, we were surprised at the occurrence. In the course of the evening it blew a severe hurricane, accompanied by a very heavy fall of rain, which may account for their unwillingness to leave the place, which was to shelter them from the storm, of the speedy approach of which they seemed to have an instinctive knowledge.

" After feeding, they often fly round and round in the air for a few minutes with great velocity, emitting a sharp note, and then, alighting upon the top of a high tree, they remain there for some time. Upon a fine sunny forenoon, about the end of January, I have heard them warbling to each other, in low pleasing strains, bearing some resemblance to the notes of the Bullfinch.

" That Crossbills occasionally breed in Scotland, I can now assert from personal observation. About the end of March 1839, a pair began to build at the extremity of the upper branch but one of a spruce-tree about forty feet high, growing in the middle of a small clump of firs upon the banks of the river Avon, in the parish of Torphichen, and about sixty yards from Crawhill House. The outside of the nest was formed of the twigs of the Scotch fir and spruce, the bark of the larch drawn

by their bills into strings, and different kinds of grasses. The inside was lined with the strands of bass matting torn into fine pieces, intermixed with moss and a considerable quantity of human hair of different shades of colour, which had been picked up by them before the doors of some cottages in the immediate neighbourhood. The nest contained three young ones, which were fledged about the beginning of May, and continued to fly about with their parents for nearly two months.

" In the beginning of April, at the distance of about three hundred and thirty yards from the celebrated Wallace Stane, in the parish of Polmont and county of Stirling, a pair of Crossbills built a nest and reared their brood. The nest was placed at the extremity of the lowest branch of an old Scotch fir, nine feet from the trunk, and as nearly as I could guess about twenty from the ground. The tree was eleven yards from the high road, upon which people are passing and repassing almost every hour of the day, and twenty-eight yards from a cottage which was occupied by a labourer and his family. While the female was feeding her young, the male usually sat near her, and kept up a continual chattering. They always flew off together in search of their food, uttering their sharp shrill note, not unlike that of the Greenfinch, but stronger. Upon Sunday afternoon, the 5th of May, whilst some boys were in pursuit of their favourite amusement, they unfortunately discovered the nest, and as they could not reach it by climbing, they pelted it down with stones. It contained three young ones about half-fledged. One of them was killed by the fall, another was destroyed by a cat, and the third is still alive. When about six weeks old, it was remarkably tame. It crept upwards and downwards in its cage, both with beak and claws, in the manner of a parrot, and occasionally attempted to sing. The nest was larger than that of the Green Linnet. The outside was chiefly composed of the old twigs of the larch and Scotch fir, with fibrous roots and grass; and the inside lined with fine moss and grass, and different kinds of hair.

" Since the month of November 1838, a pair of Crossbills have frequented an old Scotch fir plantation upon the estate of

Torbanehill, belonging to Sir Richard B. J. Honyman, Bart., about a mile from my house. Sometime in the beginning of April 1839 they built a nest, but I could not discover it, as the trees were high and the branches very thick. On the forenoon of the third of June, after the young brood had flown, I observed the parents feeding them with the seeds of the larch, uttering whilst doing so a kind of twittering note, and when I approached them, the old birds set up a very loud cry of alarm, and seemed to be in great uneasiness. I fired at one of the young birds, and killed it. The remaining two of the brood flew off with great rapidity to a considerable distance, accompanied by their parents.

"On Tuesday morning the 4th of June last, ten Crossbills were seen pecking seeds out of the cones of the larch, in a plantation in my neighbourhood. There were four old and six young ones. They were the last that were observed during the season."

The young bird mentioned above as having been shot while its parents were feeding it, was sent to me by Mr Weir, and is still in my collection, being preserved in spirits. The plumage is not perfect, as the quills and tail-feathers had not attained their full growth.

Length five inches and eight-twelfths; extent of wings ten; bill along the ridge seven-twelfths; wing from flexure three inches and two-twelfths; tail one inch and one-twelfth. The bill is perfectly symmetrical, being rather short, robust, trigonal at the base, considerably compressed, and much higher than broad; the outline of the upper mandible decurved, its sides sloping and flattened, the edges straight, sharp, and slightly overlapping; the tip very small, acute, deflected, only one-twelfth of an inch longer than the lower; the lower mandible with the angle broad and rounded, the dorsal line ascending and nearly straight, the edges involute, the tip pointed and a little ascending. The lower jaw is of extreme width at the base, the distance from the exterior of one joint to that of the other being nine-twelfths of an inch. The lateral motion is very great, but there is no greater facility of movement toward one side than toward the other, the tips of the man-

dibles being separable in a lateral direction three and a half twelfths to either side. On the roof of the upper mandible are two longitudinal flattened ridges. The tongue as in the adult.

The general colour of the plumage of the upper parts is dull greyish-ochre, longitudinally streaked with dusky, the central part of each feather being of the latter colour, which is more decided on the back; the rump with more yellow, the cheeks and sides of the neck lighter. The lower parts are white, the fore part of the breast tinged with yellow, and the whole under surface streaked with greyish-brown in linear-oblong lines. The quills and coverts are blackish-brown, narrowly edged with pale yellowish-brown, as are the tail-feathers.

Mr Yarrell, in his beautifully illustrated and carefully compiled History of British Birds, describes a young Crossbill which "was brought from Hampshire at the latter end of March, and was obtained within a few miles of Winchester. Its whole length is only five inches; the feathers of the wings and tail not yet completed; the former measuring but three inches from the carpal joint to the end, and the tail-feathers only extending five-eighths of an inch beyond the ends of the upper tail-coverts. This bird cannot have flown far from the nest in which it was reared, and was probably hatched about the beginning of March. In the colours of its plumage it very closely resembles those on young birds of the year when obtained in June, namely, the head, neck, and upper part of the back, the rump, and all the under surface of the body, greyish-white, streaked longitudinally with dusky brown; the feathers of the wings and tail dark brown, with narrow edges of pale brown; the beak, though rather long, has both its mandibles perfectly straight, the lower one just shutting within the edges of the upper, nor is there the slightest indication to which side either mandible would hereafter be inclined."

It thus appears, that until the Crossbill has used its beak in extracting the seeds from between the scales of the cones of pines and firs, so as, by the peculiar action which it employs in so doing, to bend the tip of the upper mandible to one side,

the curious crossing and elongation of the tips of the mandibles characteristic of this genus are not observeable, the bill being similar to that of a Finch or Sparrow, though stronger and more compressed. In this respect the Crossbills are not singular. Thus, the Oyster-catcher, when young, has the tips of both mandibles pointed, and that of the upper considerably elongated; whereas, by the action of driving limpets from the rocks, the end of the bill is ultimately thinned on either side, so as to become wedge-shaped. It appears that in some degree the bills of Woodpeckers owe their cuneate form to the same cause. The thin edges of the mandibles of many sea-birds, as the Gannets and Phaetons, become transversely or obliquely fissured by use; and the serratures on the claws of Gannets, Cormorants, and Herons, have no existence while the young birds remain in their nests.

The undue prolongation of the mandibles, in consequence of a deflection from their natural direction, is frequently observed in the Rook, which, on account of its habits, is peculiarly liable to this accident. It is also not unfrequently seen in cage-birds. The elongation of the upper mandible invariably takes place in all birds which, by captivity, are prevented from using their bills in the natural manner or degree, and is usually very conspicuous in tame Eagles and Parrots. This abnormal growth is not confined to the mandibles, but is common to all horny parts, as the claws and hoofs of birds and quadrupeds, as well as the horns of the Ruminantia, and extends even to the teeth, as is naturally seen in the Hog genus, and accidentally in the Glires.

EMBERIZA SCHŒNICLUS. THE REED BUNTING.

Vol. I, p. 453.

In winter and spring this bird feeds much on the buds of willows and other trees or shrubs, growing in marshy places. I have derived much pleasure from watching a flock so engaged; for they cling to the twigs in various positions, and exhibit nearly as much activity as the Siskin does when similarly en-

gaged in picking the seeds from the catkins of the alder. Even during frost, it is seldom met with at a distance from water.

CORVUS CORAX. THE RAVEN, OR CORBY CROW.

To p. 515. vol. I.

Vol. I, p. 498.

Having

~~I have~~ described the manners of this interesting bird, as observed by me in the Hebrides, where it is not uncommon, ~~The following notice~~ by Dr Laurence Edmondston, which refers to it as studied in Shetland.

Insert present statement

" The Raven uniformly breeds in the most inaccessible precipices, and has three or four young. He is destructive to lambs, and to weak animals of every kind. His first attacks are always directed at the eye, and if unmolested, in a few seconds the animal may be destroyed, for he not only digs out the eye with his powerful bill, but penetrates to the brain in the course of the optic nerve. He has consequently been long proscribed, and a price set on his head. He is the true Gregarach Ornithos of Hialteland, levying black mail with unscrupulous assiduity if not courage. More recently indications of a milder legislation have appeared. The spirit of retrenchment, economy, and free trade, hostile to all bounties, and the philanthropy of reform reprobating all capital punishments, will ere long, it is to be hoped, enable the Corby Dhu sublimely to croak in security amidst the lonely moors and naked rocks of ' melancholy Thule.' His note, although, it must be confessed, not over-melodious, is varied and expressive. One of his solos is thought peculiarly indicative of an approaching funeral. It is strange that in almost all countries where he occurs, some lugubrious superstition is associated with him.

" This bird, although scantily provided with fat and feathers, is especially the denizen of cold regions, and is impatient of heat, even of our summer. He becomes languid and oppressed, ruffles his plumage, and fans himself with his wings, panting with open mouth like a fatigued dog. Can the alkaline putrescent nature of his food stand in any relation of cause or effect to this impatience of high temperature ?

"No instance that I am aware of has occurred in this country of the White or Piebald Raven, although it is perhaps as common in the Fœro Islands as the Black, and where it is said both kinds are sometimes found in the same nest, the parent birds being indifferently of either colour. This latter point however requires stricter inquiry. Those islands are 180 miles from here; but this is no great journey for such a bird as the Raven to perform. From this we may conjecture that the species is indisposed to migration to any distance, at least across the waters; or we may suppose that this Piebald Raven is a very distinct and permanent variety. The Fœroese often teach the Raven to speak, and they prefer for this purpose the Piebald. Previous to instruction they cut, I believe, the frenum linguæ, and then they initiate him into all the classical mysteries of old Norse.

"A curious fact in the history of the Raven is the use to which he was applied by the ancient and intrepid Scandinavian mariners. To them he was as the magnet to the moderns; he was the great precursor in their adventures of nautical discovery and national agitation. When uncertain of their course, out of sight of land, yet imagining it to be near, a Raven was let loose. If he left the vessel, the course he took was steered, experience seeming to have taught them that land was near, and in the direction of his flight. If he returned to the ship, it was supposed to be at a distance. In this way, the Icelandic Sagas, so remarkable for the air of minuteness and truth of their narratives, inform us was Iceland originally discovered. What led these bold and resistless Vickinge to select the Raven for their nautical pioneer? History points to Asia Minor as the origin of Odin and his people, and the tradition there of the use of the Raven in the Deluge may have led to his employment by them in their first attempts at navigation. In possession of such a tradition, as mostly all the inhabitants not utterly uncivilized of that part of the globe might be supposed to be, and in the natural ignorance of an inland tribe of maritime affairs, it was not unlikely that in their first attempts on the ocean, they would have recourse to the terrene instinct of the Raven, when nothing but the pathless sea was around.

But, whether they were led to this practice by oriental tradition or spontaneous ingenuity, it is a very remarkable circumstance in the history of as remarkable and heroic a race as ever existed.

" Then—to return to the Piebald Raven—May it not have been a peculiar variety of Raven, and not the common, which was thus made use of? and this might have been the Piebald. This hypothesis might plausibly account for his frequent occurrence in Fœro or Iceland, and his absence here. In Shetland he would naturally at first be less frequent, for, as it lies comparatively near Norway, and from thence is easy to be found, little necessity would after its first discovery have existed for letting loose such feathered pilots. Moreover, Shetland has been longer and more numerously peopled, it is nearer other countries, and Piebald Ravens would attract more attention, would be more easily captured, or more apt to wander. Almost every voyage to Iceland or Fœro on the other hand, in these early and rude, though daring, periods of navigation, would seem to have required such advanced guards.

" Another inquiry is this :—We read in many of the Sagas of Ravens as inseparable companions, as unquestionably they were appropriate emblems, of the devastating progress of the Sea Kings. The Raven was the sacred standard of the great Odin. Whence were the supplies of these birds derived? As they seem to have been at certain periods essential to the Northmen in their piratical or exploratory voyages, and many would of course be necessary, they must have trusted to other sources of supply than the precarious and scanty ones of the nests of the wild birds, which at best, from the constant habits of the species, are, even when found, of all others the least accessible. The probability is that they were kept by them in a semi-domestic state, as we observe Storks, Carrier Pigeons, Eider Ducks, &c., in certain instances; and if they were so for many generations, this may seem to account for the sporting of colour, for the habits and other specific characters of the Black and the Piebald appear alike. One of the latter I kept tame for several months, but could detect no peculiarity. If they are originally the same, the great permanence of the Piebald variety

under circumstances similar to those of the common, its definite and circumscribed residence, are singular facts; for, although a full or partial albino Raven may as a matter of great rarity occur in other countries, in none is the bird to be met with that I have heard of so numerously as in Fœro. Is the Raven of Piebald colour, or peculiarity of habit, or species, or domesticated, to be found anywhere in Asia Minor? On the whole, I am inclined to the opinion that the ancient Scandinavians kept the Raven, and perhaps the Gyrfalcon in a semi-domestic state for many ages; that probably the breeds of both were originally brought by them from the East, and that long-continued domestication especially is the cause of the occurrence of Piebald Ravens, which is comparatively so common in some of the more distant colonies of Norway, such as Fœro and Iceland. A curious presumption would, from these desultory speculations in which I have indulged, seem to arise for the Asiatic origin of the Scandinavians; and thus ornithology would throw light on a most important and influential epoch in the history and migrations of nations; and further, it might lend weight to the arguments for Revealed Theology by corroborating the facts and traditions of Noah's Deluge. Among some of the tribes of the Caucasian range might we then wander, to unfold the germs of many of the institutions of the Gothic race, instead of taking Tacitus and Torfœus for our guides, and limiting our researches into the theory of our manners, and the foundations of our jurisprudence, to the woods of Germany or the rocks of Scandinavia."

Mr Mackinnon, factor for St Kilda, informs me that Ravens are very abundant there, and attain a large size. He has never observed any white or pied individuals.

Young

CORVUS CORONE. THE HODDY OR CARRION CROW.

Vol. I, p. 516.

Mr Harley has favoured me with the following account of this bird, as observed by him in the county of Leicester:—"Although the Raven has been totally exterminated in this part of the

country, it has fared far otherwise with the Carrion Crow, Corvus Corone, which, I am happy to say, abounds with us, albeit every man's hand appears to be uplifted against him. I generally see a pair or two all the year round close to our town. They haunt the river side, keeping a sharp look-out after the animal and vegetable offal left upon the pastures by sudden inundations. These birds, however, are not numerous in the immediate neighbourhood of Leicester, being much harassed by the gamekeepers; but in the southernmost part of the county, they are abundant. There the fields are large, grassy, and open, being principally adapted for pasturage, and feeding cattle for the London markets. There being thus little tillage, and a corresponding paucity of game, the Carrion Crow is not there persecuted as in other parts of the county, where game is abundant, and persons are employed to protect it. Hereabouts I have seen it in little groups of fours and sixes, perhaps so many families, which had not broken up their brotherhood. The Carrion Crow is easily known by its black mandibles, and loud sonorous croak, which is deeper and less frequently emitted than that of the Rook, and in uttering which it distends and stretches out its neck, after the manner of the Turkey, this habit being not so perceivable in the Rook. Besides, it is the latest of our diurnal birds in retiring to roost. I have seen them in the pastures when it has been nearly dark, so that I have come upon them unobserved. On the 9th October 1839, when crossing a large pasture field, I came upon a pair that were feeding on the black beetles and their grubs, Geotrupes stercorarius, which are always to be found in great plenty in pastures and old inclosures where cattle feed. The evening was dark and overcast, so that I could not discern them at a greater distance than about ten yards; but there was no croak, no sound save the whistle of their wings, as they made their circuit around me to settle upon the ranpikes of a solitary ash. I mention this circumstance in order to shew that it is not in the breeding season alone that we find the Carrion Crow so late in the pastures. I am indeed persuaded that it remains upon the pastures long after all our diurnal non-migrating birds have retired to rest

for the night; and it is in consequence of their feeding in silence that we do not notice them so late in the evening. I know the loud croak of this bird may be heard in wooded countries, but am persuaded it feeds where and when

> ' The beetle homeward wheels her droning flight,
> And drowsy tinklings lull the distant fold.'

" The Carrion Crow does not cover her eggs when she leaves the nest, after the manner described by some ornithologists; at least I have never been able to discover that habit in this bird, and I think I should have done so had it existed. When I was a boy, I have not only been up to the nest of the Carrion Crow, but have plundered some scores, and when farther advanced in life I have peeped into many, to gratify my curiosity. I can speak of the eggs being very subject to variety in colour, and also in shape, so that a person not aware of this, might, on seeing some, be doubtful as to whether they belonged to the Carrion Crow or the Rook. It sometimes has young late in the season, even in September. Thus, on the 9th October 1839, I saw four young ones just fledged at Foxton, in this county. They could have left the nest only a few days, as they were not thoroughly strong upon the wing, when I saw them. Indeed Mr Stain assured me they were bred in an elm tree, in one of his hedge-rows. The old birds were feeding there when I saw them."

CORVUS CORNIX. THE HOODED CROW. Vol. I, p. 529.

In my account of the habits of this species, I alluded to the alleged conventions said by Mr Low and others to take place, but of which I had not seen any example. Dr Edmondston, in the following notice, describes them as observed by himself in Shetland.

" The Hooded Crow remains with us throughout the year. It breeds on cliffs always easily accessible, and produces annually four and sometimes five young. It is easily tamed, and is lively and familiar, but from the inveterate habit of conceal-

ing every thing, it becomes often a troublesome pet. This propensity, which all its congeners seem to possess, I am disposed to ascribe to their instinctive desire for carrion, not to that of hoarding and concealing food to serve as a future supply. Their natural and favourite food is what is in a putrescent state, and burying it under ground is one means of producing this. The dog does the same, and he always prefers putrid carrion in his unsophisticated state to fresh animal substances. There is some analogy between the Dog and the Crow, viewed in their respective places in the scale of nature.

"A curious habit of this species is what is here termed *Kraas Court*. The season when it occurs is I think always spring; but it is not a regular or frequent habit. Flocks of scores or hundreds may be seen for an hour or so assembled. A few of the number are loquacious and locomotive: these may be regarded as the barristers. The great majority are taciturn and quiescent, appearing to be listeners or spectators, intent on the issue of the proceedings. Neither judges nor jury, witnesses nor accusers, have I been able to discover. After the meeting has quietly separated, one or two corpses are not unfrequently found remaining in the place where the Ting has been held. What the mode of execution had been even a post-mortem examination throws no light upon. It must, at all events, have been sudden, for no such indecorous or prolonged indications of an execution as sometimes takes place among clothed bipeds, are observed among Hooded Crows. Here is realized the great desideratum of certain Utopians in legislature, that of bringing prompt if not gentle justice to every man's door. A capital crime is pled, judged, punished in an hour. Truly we, unfledged lords of the creation, have much to learn and unlearn, reform and improve. Another theory, less solemn and imposing it is true, but perhaps more agreeable to vulgar fact, may be this:—that the Kraa's Court, instead of being a College of Justice, with its acts of sederunt and other supreme powers and privileges, happens in this way. Some strangers or long emigrant Hoodies appearing near the domiciles or hunting grounds of the resident aborigines, are by them in-

hospitably, or as some would say patriotically attacked, as would be the case in similar circumstances in rookeries.

" A favourite food of the Hooded Crow is the Periwinkle ; but the shell is hard, and in order to get at the inhabitant, the Crow may often be seen near the sea-shore, flying up in the air from twenty to thirty yards, and letting it drop. The object seems to be here not so much to break the shell, for this is seldom done, as to kill the limax by concussion, and this is generally effected by repeated falls, whether these take place on the sward or beach. The Cornix is not it seems a bad pathologist : he knows the difference between fracture and concussion, and avails himself of this knowledge.

" Enormous multitudes of this species inhabit in winter the cities on the shores of the Baltic, as Dantzic, &c., as I have witnessed, roosting on the house-tops, and literally covering them. They are then almost domestic and little molested, performing the duty of expert and gratuitous scavengers. In summer they disappear, probably returning to the mountains of Sweden and Lapland, for incubation ; for this species, like the Raven, is impatient of heat, and besides, these wilds afford them abundance of food in larvæ and wild berries."

Mr Low's account of the matter is this :—" They meet in the spring in vast flocks, as if to consult the important affairs of summer, and, after flying about in this manner for eight days or so, separate into pairs, and betake themselves to the mountains." I would suggest that, if one or two individuals are often found dead at these convocations, and if these individuals are the " talkative and locomotive barristers," they have been affected with some disease, the indications of which have induced a number of their fellows to gather around and persecute them. Thus, a sparrow, with a piece of red cloth glued to its head, or a straw or string fastened to its tail, will be presently attacked by a multitude of sparrows, and a wounded deer is pursued by the rest of the herd. Some more precise observations are wanted.

The following observations are from Mr Durham Weir :— " Hooded Crows are seldom seen in my neighbourhood. During the long period of ten years, I have known only five of

their nests. They were built upon the tops of high old Scotch fir trees. The outside was formed of twigs; upon these was placed a layer of the fine roots of trees, then about two inches of earth or clay intermixed with decayed leaves, and lined in the inside with wool, hair, and other soft materials. Of all the birds which I have attempted to gin or shoot, they are I think the most cunning. About four years ago, I found great difficulty in destroying a pair of them whilst feeding their young. For this purpose I constructed several huts with the branches of trees, within shot of their nest; but I was obliged to pull them down, as the birds would not feed their brood so long as they remained. I however discovered a plan by which I succeeded in carrying my purpose into effect. Having made another place of concealment about two feet in height, and covered it over with grass and moss resembling as nearly as possible the ground around it, I crept into it, and whilst lying upon my side, I accomplished my object by shooting both the parent birds.

"The attachment of the mother to her brood and partner is indeed very strong. I once fired at a female, when giving food to her young, and although three pellets of large shot penetrated her neck, in the course of a few hours she returned to her charge. As I could not, however, get a right view of the old birds, owing to the branches about the nest, I tied a cat next morning to the bottom of the tree upon which it was built, and by this stratagem I succeeded in destroying them. Whilst they were setting up a most dismal croaking, and flying up and down in a state of great irritation, within a few feet of their enemy the cat, I shot at the male and killed him. The next moment, when the old fellow was lying upon his back, in the agonies of death, his loving partner walked again and again round about him, dragging her wings and tail slowly upon the ground, uttering the most melancholy lamentations, as if aware of his fate. I completed the tragedy by shooting the survivor, and any qualms of conscience I might have at the time, were speedily smothered in the consciousness of having secured two good specimens of the Hooded Crow, and the recollection of their havoc amongst the game in my neighbourhood."

From those northern isles, let us betake ourselves to a southern and inland county, taking Mr Harley's report as to the demeanour of the Hooded Crow there :—" I have very little to say about the Grey or Royston Crow, Corvus Cornix, which comes to us towards the close of the year, but is not very common in these parts. It feeds in our pastures along with the Rook, Jackdaw, and Starling, and appears to live in harmony with them during the time of its sojourn. An old coachman, who for at least twenty years drove the London and Leeds Express Coach from Loughborough to Mansfield across Sherwood Forest, used to say that he knew to a day when the Grey Crows would come upon the Forest. That day he said was Guy Fawkes' day of notable memory, the 5th of November. Now whether this story of the old coachman was true or not, I shall not take upon myself to argue ; but I know some of our migrating birds are punctual almost to a day, when they visit us. In Gilbert White's Miscellaneous Observations we find this note :—' May 22d. The Flycatcher comes to my vines, where probably it was bred, or had a nest last year. It is the latest summer bird, and appears almost to a day.' Having remained with us through the winter, the Hooded Crow departs early in spring."

Very few instances are given of this bird's breeding in England, the most southern locality being in Norfolk, as mentioned by Mr Hunt. It is a very remarkable circumstance that of the Grey Crows which have bred in that country several are recorded as having paired with the Carrion Crow. Thus, Mr Williamson states that " the Hooded Crow has been known to breed near Scarborough on two or three occasions. In one instance, a female Hooded Crow was observed to pair with a Carrion Crow on a large tree at Hackness, where they succeeded in rearing their young." Two or three instances of the same kind are mentioned as having taken place in the south of Scotland ; which would lead us to believe that a Hooded Crow left perhaps accidentally in a district where there are none of its kind, may readily pair with the Carrion Crow. In the northern isles, this never happens, for the Grey Crows are there abundant, and the Black Crow never or very seldom

appears. A few Hooded Crows breed in the Lothians. I have frequently seen a family of them near Cockenzie in Haddingtonshire, and Mr Weir has found a few in West Lothian.

The digestive organs of this species are precisely similar to those of the Carrion Crow. The œsophagus of a male individual was five inches and a half in length, funnel-shaped at the commencement, in the rest of its extent nearly of the uniform diameter of eight twelfths. The stomach is a moderately muscular gizzard, of an elliptical form, somewhat compressed, an inch and nine twelfths in length, an inch and a half in breadth; its muscular coat thick; the epithelium dense, with a few deep longitudinal rugæ. The intestine is four feet long, five twelfths in width in the duodenal portion. The cœca are cylindrical, half an inch long, two twelfths in breadth, two inches distant from the extremity. The rectum dilated toward the end.

CORVUS MONEDULA. THE JACKDAW. Vol. I, p. 552.

The Jackdaw is a common bird in Leicestershire, according to Mr Harley, who informs me that it there resides "in hollow trees, the ash, elm, horse-chestnut, oak, or maple, as well as the ruined tower, the venerable gateway, and lofty spire. Jackdaws," he adds, "will sometimes breed in chimneys, even when used. About 1810 I recollect seeing a servant man of my father's take a nest with four or five young ones out of a chimney, which was constantly kept in use. It was perhaps twenty yards high. The nest was built across from ledge to ledge, about two feet from the top, and a very large one it was too. I recollect seeing a wheelbarrow load of sticks and cow-hair, and bits of old cotton print and strings. Jerry Hayes, who took it down, was then, and is now, a daring fellow, a good bird's-nester. I have seen a Jackdaw in which the nape of the neck was nearly white, the throat white, the breast whitish-grey, the wing-coverts white, and the tail-feathers tipped with the same."

FREGILUS GRACULUS. THE LONG-BILLED CHOUGH. Vol. I, p. 587.

In an individual obtained in the Isle of Mull, the œsophagus was four inches and a half in length, of nearly uniform width; the proventricular portion one inch long. The stomach oblong, an inch and three-eighths in length, an inch and one-twelfth in breadth; its muscular coat moderately thick; the epithelium dense and rugous. The intestine was two feet long, four-twelfths in width in the duodenal portion; the cœca half an inch long, and two-twelfths in breadth. In the stomach were a Carabus, several spiders, a vast number of small white larvæ, a grain of oats, and some particles of quartz.

THREMMAPHILUS ROSEUS. THE ROSE-COLOURED COW-BIRD. Vol. I, p. 613.

A beautiful specimen of this bird was shot in July 1839 at Ladythorne, the seat of R. Wilkie, Esq. It was an adult male, in perfect plumage. The most northern locality that I have been credibly informed of, is the neighbourhood of Dingwall, in Ross-shire.

PICA MELANOLEUCA. THE MAGPIE. Vol. I, p. 562.

Although not usually social, the Magpie is sometimes seen in large flocks. In the spring of 1839 I observed twenty-one in a grass field near South Queensferry. Mr Harley informs me that in England also "it becomes in part or temporarily gregarious, in the month of February, if the weather is open. For instance, I once counted forty-six together in a low pasture field on the banks of the Derwent in Derbyshire, in 1834. It abounds in Leicestershire, and remains in pairs throughout the year. Indeed I do not think any migration whatever, partial or general, takes place in this species. Why such a

wary bird should at times choose the lowly hedge-row, or solitary thorn bush, for its place of nidification, when in the same hedge-row are trees which to all appearance would afford it better protection against the prying urchin, or destructive gamekeeper, or wandering naturalist, is a question which in my opinion is not likely to be soon solved. I have found its nest in very solitary thorn-bushes, and not more than ten or twelve feet from the ground. Circumstances like these have given careless observers an idea that we have two kinds of Magpies, the Tree Mag, and the Hedge Mag. It builds occasionally not only close to the cottage door, but even in the midst of towns. In 1820, I saw in the middle of Loughborough a magpie's nest on a very tall elm, in a gentleman's garden; but this nest was not renewed in 1821. The Magpie makes use of the old materials in building her nest, as I have ascertained beyond dispute. In a spruce-fir tree, Pinus Abies, growing at Thorpe Cottage, in this county, I have known a magpie's nest having been made since 1814, year after year; and there is at this moment (1839) a nest in the same tree which the magpies used last spring. I shall not attempt to prove that the same pair have tenanted the nest all along, but it is reasonable to suppose that some members of the same family have."

Another correspondent, Mr R. D. Duncan, informs me of a Magpie's nest which "was fixed amongst the top branches of a hawthorn bush by the side of the northern road between Edinburgh and Glasgow. This presents us with a new trait in the character of the Magpie, as it exhibits a boldness not often used by it."

GARRULUS GLANDARIUS. THE BLUE-WINGED JAY.

Vol. I, p. 576.

The Jay occurs here and there in the woods skirting the Grampians from Forfarshire to Dumbartonshire, and in all the more or less wooded districts to the southward. Mr Harley informs me that it is found at all seasons in the hedge-rows,

coppices, or umbrageous woods of the county of Leicester. "I believe," he adds, "none of our woodland species are more destructive to the eggs of the smaller birds. I have found its nest in the holly, as well as in the 'hazel mantled with woodbine,' but never in a hedge, or hedge-row tree." In a list of some of the birds of Glamorganshire obtained by Mr Hepburn for me from the Rev. James Evans, Landaff, is the following notice. "The severest conflict I ever witnessed between birds was between a cock Blackbird and a cock Missel Thrush, on the one hand, and a Jay on the other. The conflict was carried on to the music of the most horrid shrieks I ever heard. It ended in the Jay disappearing in a cloud of his own feathers. The assailants retired together in another direction, seemingly perfectly satisfied. As it was in the breeding season, the Jay had probably attacked their nests." "Of the voracious habits of this bird," says Mr Durham Weir, in a recent communication, "I was not until lately aware. Having got a male which was caught in a trap on the afternoon of the 26th January 1838, I put him into the tool-house of my garden, in which I kept a variety of birds. Upon going in next morning I was astonished at finding that two of them had been devoured. I thought that rats had killed them, but I soon discovered that I had been mistaken. A Rose Linnet having alighted upon the branch of a tree which I had fixed in the wall, and upon which the Jay was sitting, he caught him by the throat with his bill, and killed him in a few minutes. In about half an hour after this, he preyed upon a green linnet, and after plucking off the feathers, he swallowed the whole bit by bit, except the head."

TURDUS PILARIS. THE FIELDFARE THRUSH.

Vol. II, p. 105.

Mr Harley has ascertained that even in a partially wooded district, this bird, sometimes at least, reposes on the ground. "In the neighbourhood of Leicester it appears in September, and departs in May and June. It most certainly roosts on the

ground, amongst long grass and tall herbage. About nine miles below Leicester, on the banks of the Soar, there is a celebrated place of resort of these Thrushes, but more particularly one meadow, which may be called a dormitory; for, toward nightfall, throughout the winter months, I have seen thousands wending their way thitherward for the night. This movement of the Fieldfares is almost as regular as that of the Rooks. I have been there both late and early, and so also was the Fieldfare; for which reason I am fully persuaded Colonel Montagu was justified in concluding that this bird reposes on the ground. I may as well mention, however, that while the movement of the Rooks toward their roosting trees is performed silently, that of the Fieldfares is accompanied with a garrulous noise. They proceed in straggling parties, some making half circles, flying back as it were in the midst of their companions, others straggling onward, but all bound to the same roosting grounds." This is also usually the manner of flying of the Starling, Brown Linnet, and, I believe, in some degree, of all the smaller birds which are densely gregarious.

RUTICILLA PHŒNICURUS. THE RED-FRONTED REDSTART. Vol. II, p. 305.

The young, when fledged, have the bill flesh-coloured at the base, dusky toward the end, the inside of the mouth yellow, the feet purplish-dusky. The upper parts are olivaceous, spotted with reddish-yellow, each feather having an oval mark of that colour, and terminated by dusky; the rump yellowish-red, faintly undulated with dusky; the tail dull orange-red, except the middle feathers, which are dusky; the quills and coverts dusky brown, edged with yellowish-red; the lower parts bright buff, the margins of the feathers dusky; the abdomen with fewer markings; the tail-coverts pure buff.

PHILOMELA LUSCINIA. THE NIGHTINGALE. Vol. II, p. 321.

"It is firmly asserted by several naturalists," says Mr Weir, "that the northern boundary of the Nightingale is in the neighbourhood of Doncaster in Yorkshire, as no well authenticated instances have been adduced of its appearance beyond that town. Yet Captain Hamilton Dundas assured me, that whilst riding home from Edinburgh to Duddingston House, one morning in June 1839, he heard one of these delightful birds pouring forth his melodious strains in the neighbourhood of Dalmeny Park, the residence of the Earl of Rosebery. He said he could not have been mistaken, having had frequent opportunities of hearing them in France, Germany, and England."

SYLVIA ATRICAPILLA. THE BLACK-CAPPED WARBLER, OR BLACKCAP. Vol. II, p. 339.

I have received from Mr Weir the following notice respecting this bird:—"On the morning and forenoon, and part of the afternoon of Tuesday the 25th of June 1839, the thermometer 62° in the shade, in the shrubbery near Polkemmet House, Parish of Whitburn, Linlithgowshire, I listened with pleasure to the music of this charming warbler of the grove. As the foliage of the trees was greatly injured by the severe frost that had taken place on the 14th and 15th of the previous month, I had a favourable opportunity of observing his habits. Between seven and nine o'clock he sang almost incessantly. After having been silent for two hours he again commenced, and continued his song for a considerable time. From the top of a tree he sometimes poured forth his delightfully melodious strains, at other times from the middle of a shrub. When singing, the feathers upon the crown of his head were generally erected, and his throat considerably inflated. He was uncommonly lively, and in constant motion, flitting from branch to branch with the greatest activity in pursuit of flies. He

examined almost every sprig, and pecked the larvæ of insects from the bark. His flight was usually short and very rapid, and many of his motions were like those of the Willow Wren. I never observed him alight on the ground. As he continued so long about the same place, I thought that the female was then sitting upon her eggs. Being very anxious to discover the nest, I searched for it very diligently. The attempt, however, proved unsuccessful. On Thursday the 27th I renewed it, being assisted by a youth. For nearly six hours we examined almost every spot in the neighbourhood, with the same bad success. From seven in the morning until one o'clock in the afternoon, he poured forth his delightful melody. On Wednesday the 3d of July, a very warm day, the thermometer in the shade being at 64°, I again went in search of him. To my great grief, however, I was informed that for two days he had neither been seen nor heard. On my return home, about four o'clock in the afternoon, I met with my old friend singing in a plantation, at the distance of about a quarter of a mile from his former retreat. In this well-sheltered and sequestered spot his continuance was but short, as in the course of two days he took his departure from the neighbourhood. From his restless disposition I have no doubt that he had not as yet paired, and was in pursuit of a mate to console him in his retirement. If the above observations be correct, they will not, at least in this instance, favour the opinion of the celebrated Montagu, who thought that the male of the migrative species never quits the place he first resorts to, but attracts the females by his song. On Tuesday the 9th of July, the thermometer 60°, and the wind south, when I was in search of a kingfisher's nest on the banks of the Avon, in Kinniel Wood, I heard one singing most melodiously. And on Tuesday afternoon, the 16th of the same month, the thermometer 63°, the wind S.W., I heard another near Carriber Mill, parish of Torphichen. As the underwood was exceedingly thick, composed of the sloe and bramble, I was unable to get within shot of him. The situations which the Blackcaps seem to prefer are close thickets, and woods very rank with undergrowth."

SYLVIA HORTENSIS. THE GARDEN WARBLER. Vol. II, p. 345.

"The Garden Warbler," Mr Hepburn writes, "is pretty generally distributed in East Lothian, and is especially abundant in the plantations and thickets on the brink and at the foot of the old red sandstone cliffs in the Glen of the Whittingham Water. I never observed it until the 11th of May 1839, when one alighted near me on the margin of Pressmenan Lake. As a songster I think it superior to all our Scottish birds. For about a month after its arrival, you may advance within six or seven yards of it, as it flies amongst the broad leaves, snatching its prey, and boldly replying to the rival notes of its fellows, which at intervals fill the whole glen with their wild warblings. I have found its nest in tall hedgerows, sloe thickets, and amongst the branches of young spruce and hawthorn trees, at a few feet from the ground. Sometimes it was very indifferently concealed. The young are mostly fledged by the beginning of July; but some broods not before the end of that month. If you approach a nest containing young, the parents shew themselves at first, but soon retreat to the thickest shade, uttering a note resembling the syllable *check, check*. The song of this species ceases about the middle of July. The last bird which I saw was on the 7th of August."

SYLVIA GARRULA. THE WHITE-BREASTED WARBLER, OR LESSER WHITETHROAT. Vol. II, p. 357.

"After many unsuccessful attempts," Mr Weir writes to me, "I at length succeeded, on Thursday forenoon, the 13th of June 1839, in discovering the nest of the Lesser Whitethroat in the midst of a plantation about fifty yards from my garden. It was built in a tuft of windlestraw grass, Aira cœspitosa, of the preceding year's growth, about four inches from the ground, and overshadowed by the branches of a larch tree. It is smaller and more compact than that of the larger Whitethroat, and

is here and there intermixed with the coverings of spiders' eggs. In its structure it is not unlike the one which Mr Selby found in Suffolk, and contained five eggs."

The nest and an egg having been sent to me, I may here describe them. Although more compact than that of the Whitethroat, as observed by Mr Weir, the nest is still but loosely constructed. It is bulky, for the size of the bird, formed externally of soft but coarse straws and blades of grass, with a considerable number of threads and tufts of a fine greyish-white downy substance, several cotton threads, some of which have been in cloth, and a few tufts of down, loosely interwoven. Within this outer layer the grasses are finer, chiefly of Agrostis, and the inner layer is formed of fine grasses, delicate fibrous roots, a considerable quantity of hypna and other mosses, intermixed with fine fibres and hairs. Two or three stalks of a Galium, which appears to be the palustre and a few stems of Stellaria appear in the outer layer. The external diameter is four inches and a half, the internal two and a half, and the depth of the interior an inch and nine-twelfths. The egg is broadly oval, but rather pointed, greyish-white, faintly marked all over with pale greyish-brown, and having a zone of stronger and larger purplish-grey spots at the larger end; its length eight-twelfths, its breadth six-twelfths.

"On Monday morning, the 17th of June," Mr Weir continues, "when walking in my shrubbery, about eighty yards from the nest, I found a portion of the shell of one of the eggs of this bird. As I had on the preceding day caught a Magpie in a trap, in the immediate neighbourhood, I ran to the spot in a state of alarm, thinking that the nest had been pillaged by some bird of prey. I was, however, agreeably disappointed, and discovered in the nest a newly-hatched young bird. The shell had been instinctively taken away by the mother, in order to prevent the discovery of the place of her retreat. The male occasionally sang amongst the shrubs and trees, at the outside of the garden. The song was not so loud as that of the Larger Whitethroat, and I never observed him utter it on the wing. When in a state of alarm he set up a peculiar shrill note which I had never before heard. In his habits he was so uncommonly shy and retired that I

could very seldom get a glimpse of him. The female usually dropt from her nest in the same way as the Grasshopper Chirper, and with the most astonishing rapidity winded her way through the grasses, weeds, and other entanglements, and in a moment disappeared. When catching insects their motions seemed to be like those of the Larger Whitethroats. Their young ones were very impatient of observation, for on my taking one in my hands in order to examine it, it no sooner gave a chirp, no doubt its alarm-note, than the rest of them immediately leaped out of their abode, although not much more than half-fledged, and with great celerity hopped amongst the grass."

Another nest of this bird obtained near Oxford is very similar to that found by Mr Weir, but has no moss internally. Both are so loosely interwoven that one may perceive an object through them. In the English specimen the outer blades of grasses are larger, and instead of cotton thread, some small tufts of wool are intermixed. The interior is formed of delicate panicles of grasses, fine fibrous roots, and a little hair, its breadth two inches and a half, its depth one inch and ten twelfths, the external diameter four inches and a quarter. The five eggs which it contains are similar to that described above, but less broadly ovate, and varying considerably in their tints.

Mr Hepburn informs me that he saw seven or eight individuals, in East Lothian, in the summer of 1839.

CALAMOHERPE ARUNDINACEA. THE MARSH REEDLING. Vol. II, p. 395.

"This bird," says Mr Harley, "invariably attaches its nest to the stalks of reeds, and to those of the common nettle. I have before me a nest which I took from a willow-holt, on the 20th of May 1839. It is attached to three stalks of the nettle, and was about four feet from the ground. It is internally and externally composed of fine grasses, and small fibrous roots, without any hair about it. The nettle stalks were of the previous year's growth. It is deeper and more bulky than that

made by the Sedge Reedling. As far as my observations have gone respecting this bird, it does not haunt the hedge-rows, either of hawthorn or sloe, hazle or white willow, after the manner of the Sedge Reedling, but keeps closely concealed amongst osiers, reeds, and equiseta. It clings to the reed stalks and hangs about them in the same way as the pretty Goldfinch clings to the thistle. The notes of the male are a hurried *chiddy*, *chiddy*, *chiddy*, *chit*, *chit*, *cha*, *cha*, *chit*, *chit*. It is a true polyglot, mocking in turn the Sparrow, Swallow, Whitethroat, and Chaffinch, running from the note of one into that of another."

Mr Durham Weir has favoured me with the following note: "In my former communication regarding this bird, in the list of the summer visitants of West Lothian, it ought to have been stated, I have only known of one nest, *supposed* to have been that of the Marsh Reedling. As I had not an opportunity of seeing the birds themselves, nor of examining the nest out of which the egg had been taken (the nest having been carried off by some boys the day after the female had begun to sit), I cannot give any decided opinion respecting it. The egg was compared with several eggs of the Sedge Reedling, with which it did not agree, and as it had a strong resemblance to some specimens said to be those of the Marsh Reedling, and very nearly corresponded with the account given of them in several works, it was thought by an able ornithologist to be one belonging to this species. As there is however such a difference between the eggs even of the same bird, I frankly admit that he might have been mistaken in his conjectures, and therefore it must be received with doubt, until corroborated by more extended observations."

CALAMOHERPE PHRAGMITIS. THE SEDGE REEDLING. Vol. II, p. 390.

"This bird," Mr Harley writes, "is much more widely dispersed over the midland counties than the Marsh Reedling.

It is a true babbler, a thorough mocking-bird, but may easily be distinguished from its congener, not only by the buff streak over the eye, but by its frequenting the hedge-rows more than it. Close to Leicester, it haunts the same hedges as the White-throat, but I have usually found the hedges where both these birds abound, to be choked in the summer with reeds, horse-tails, and rushes, and often composed of white sloe and crab, sometimes hazel and white willow. When this bird comes to us first, he is very shy, and will scarcely let us get a peep at his striped cheek. This diffidence continues until May, when his spouse arrives, and then he at once becomes loquacious. It does not weave its nest amongst the reed stalks so commonly as the Marsh Reedling does. I have one attached to the fork of an osier twig, about three feet from the ground. It is composed of hypna, small roots of dry grass and some wool, the lining of dry grass without any mixture of hair; its depth about an inch and a half. I have never known this bird to stop with us after the 20th of September."

SIBILATRIX LOCUSTELLA. THE GRASSHOPPER CHIRPER. Vol. II, p. 399.

"The Grasshopper Warbler," according to Mr Harley, "is common in some of our braky lanes and unplashed hedgerows. On the 19th of April 1834 I heard it singing for the first time. the apparent ventriloquism of this bird is produced by moving its head about, in the manner of the male Goatsucker and the Corn Crake. In the month of June I have heard its trilling note at ten o'clock in the evening, the males then appearing to rival each other. The sibilous cry is monotonous and prolonged, like the purring of a cat, the cry of the Goatsucker, or the drone of the Chaffer. It leaves us about the 20th of September."

Troglodytes Europæus.

~~ANORTHURA TROGLODYTES~~. THE WREN.

Vol. III, p. 16.

To p. 20.

The following account of this bird by Mr Hepburn elucidates some points of its history. "About the beginning of August, when the cares of breeding are over, the Wrens resort in considerable numbers to gardens, being doubtless attracted by the multitudes of insects which frequent our fruits and flowers. At this season they roost chiefly in the ivy. With the first streak of day, the little fellow bustles from his perch, mounts some neighbouring spray, and greets the morn, 'the dew-drop trembling as the minstrel sings.' Now he gleans his breakfast among the flowers, frisks about the flower-stalks of the Dahlia and Hollyhock, which appear to abound in suitable game. A Hedge Chanter perhaps perches on a neighbouring stake, but the Wren, having a great opinion of his own dignity, resents the affront by driving him off. He now commences his toilette, arranging with care his plumage, which has become draggled by the dew-drops. If you advance toward him when engaged in searching for food, he gives vent to his alarm or anger in a sharp and very shrill chirp. If you advance nearer, the chirp becomes a sort of prolonged *chirr*, which, were it not so shrill, would very closely resemble the alarm notes of the Missel Thrush. In the winter season, when it frequents the hedges near dwellings, it is usually the first to detect a skulking foe; on perceiving a cat, it sounds its alarm note, flies to the branches overhead, displays the greatest activity, gets into a mossy fork, peeps over the side, darting fierce glances at the prowler, which it dodges at every turn till he departs. At this season it searches the eaves of stacks, the roofs of stables and out-houses, the chinks of walls and the banks of streamlets, in quest of spiders, larvæ, and pupæ, and rests at night in holes in the thatch or in the sides of stacks. A friend informs me that he has frequently taken from four to six individuals in one hole. In the end of February or beginning of March the males in earnest commence their song, which, though deficient in melody, is truly remark-

able for its boldness of tone, the fulness of joy which pervades it, and the frequency of its repetition. One cannot help remarking how the woods ring to their incessant roundelays, as they hop on the ground, thread the old hedgerow, fly from brake to brake, aye or frisk about the topmost boughs of trees which are forty feet in height. After the middle of October they gradually leave off singing, and by the beginning of November have entirely ceased. From that time to the 17th of February, this year, I heard only one individual sing. It was on a bright sunny forenoon on the 30th of December. When they recommence singing for the season, it is in a very low key, when the weather happens to be mild, and the same is the case at the time when they are about giving it up. During the season of pairing the males engage in sharp contests, striving to outsing each other. The eggs are usually about eight. I have several times seen ten or twelve, and I once found in a young spruce tree a nest which contained the astonishing number of fifteen. Two broods are sometimes reared in the season."

"I was not aware," says Mr Weir, "it had been taken notice of by any naturalist, that the European Wren, or at least some of this species, take possession of their nests as places of repose during the severity of winter, until I lately perused a very interesting account of the habits of these little birds by Neville Wood, Esq., who says, 'Whether the nests in which one or two broods had been reared in the summer are tenanted every night throughout the winter by the old or the young birds, is a question more curious than easy to determine, on account of the difficulty, almost amounting to impracticability, of catching the birds at night. This I have repeatedly endeavoured to effect with a view of settling the point, but without success.' I am happy to say that after much trouble, I have so far succeeded in determining this curious question. About nine o'clock of the evening of the 7th of March, in one of their nests, which was built in a hole in an old wall, I caught the male and female, and three of the brood, the other four young birds which were also in the nest, made their escape. They were the wrens I mentioned formerly as having during

last winter occupied the two nests which wanted the lining of feathers."

BUTEO FUSCUS. BROWN BUZZARD. Vol. III, p. 183.

On the head and neck of an individual killed in the end of March 1840, many feathers of a blackish-brown colour, very different from the umber-brown of the old plumage, were sprouting up. This circumstance I mention, because it shews that the Buzzard begins to moult at a very early season, and that, either the older it grows the darker is its plumage, or that merely the new feathers have at first a much deeper tint than their predecessors.

~~BUTEO LAGOPUS. ROUGH-LEGGED BUZZARD. Vol. III, p. 193.~~

to p. 197.

It would appear that an unusually large number of Rough-legged Buzzards visited Britain in the winter of 1839. I ~~have~~ saw ed ~~seen~~ an individual killed in Fifeshire, and another in Dumfriesshire; Mr Hepburn mentions two that were shot in East Lothian; and Mr Harley of Leicester ~~writes~~ thus:—"Is it ote not somewhat strange that so many specimens should have been killed this winter in our district. Five have been obtained at Bunney Park, five in Charnwood, and three by keeper Adams in Bradgate Park; in all thirteen. I had an opportunity of observing the habits of this bird in Bunney Park, when in company with my brother. Its flight was flagging and heavy, not unlike that of the Barn Owl, Strix flammea. We saw it make several transits from the wood to a rabbit-cover. These Buzzards appear to come in small flights. A female that was shot on the 12th November 1839, by keeper Adams, in Bradgate, measured 23 inches in length, and 54 in alar extent; its weight was 2 lb 4 oz. The wings when closed were of the same length as the tail. In its crop I found rabbits' fur, pieces of flesh, small bones, and the feet of what

seemed to be the field mouse. In the stomach were rabbits' fur and small bones, mixed with decomposed animal matter. The male was caught two days afterwards in a trap baited with a piece of flesh and the intestines of rabbits. When first seen, there were four birds, and they were surrounded by Carrion Crows, whose loud croakings foretold their approach. I have seen the Carrion Crow evince the same rancorous hostility to the Kestrel, Sparrow Hawk, and Buzzard."

*p. 200. A ~~The~~ specimen from Dumfriesshire, which was shot by Mr Shaw, head gamekeeper to the Duke of Buccleuch, is remarkably interesting. Its length was 22 inches, extent of wings 58; wing from flexure $18\frac{1}{2}$; tail $9\frac{10}{12}$. Its general appearance and colours are precisely similar to those of the bird described at p. 193, the brown tint being merely somewhat paler. But on the hind part of the neck, and amongst the scapulars, are several feathers of a chocolate or blackish-brown colour, with broad yellowish-white lateral margins. These feathers are perfectly entire, fresh, and having their bases still sheathed; whereas the other feathers are all more or less worn. On the head, hind-neck, and back a great number of young feathers, of the same black colour, are found sprouting up among the down. None of the quills or tail-feathers have been shed, and there are no young feathers on the lower parts. The bird has commenced its moult, and is in all probability a young one of the preceding year. The second plumage is thus shewn to be chocolate brown, or at all events the plumage is ultimately darker; and thus the opinion of Mr Audubon appears to be correct. As all the birds hitherto found in this country and described have been light-coloured, it would appear that no adult individuals arrive here, but that the small flocks consist of the young of a brood, and that they alone migrate so far southward; and as they return northward in spring, they have not moulted at the time of their departure. Perhaps the moult had commenced earlier than usual in this individual, for, as light-coloured birds have been seen breeding, and as the moult is not completed until the beginning of winter in this or the common Buzzard, it can scarcely be supposed to commence in general so early as March. Judging from the tints of the new

feathers, this individual would, when its plumage was partially renewed, exhibit the appearance of the adult male described in the fifth volume of Mr Audubon's Ornithological Biography.

~~PERNIS APIVORA. BROWN BEE-HAWK. Vol. III, p. 254.~~

to p. 260

Dr Robertson, of Dunkeld, Perthshire, has favoured me with the following notice:—"A very beautiful specimen of the Honey Buzzard, Pernis apivorus, Cuv. Reg. Anim., was shot on the Dalguise property, about four miles west of this, in the autumn of 1836. It was shot in an open park, near the river, in front of Dalguise House, and is in the possession of the Honourable Mr Maule. I mention this particularly, as it is the only instance known to me of this bird having been found so far north. Its length is about 20 inches. The bill bluish-black, the cere light yellow. The tarsi are well-feathered half down. The feet, as well as the uncovered half of the tarsi, yellow; claws not much crooked. The upper plumage is of an almost uniform dark brown, except on the head and upper part of the neck, where the feathers are very short and very thick-set, and of a light bluish colour. The lower part of the plumage is white, and there are one or two dark feathers on the breast. The tail is of a brownish cast, with dark bars, and extends a little beyond the wings."

~~FALCO GYRFALCO. GYR FALCON. Vol. III, p. 284.~~

to p. 288.

Sarhlan

Mr Mackinnon informs me that this bird breeds on the Main Island of St Kilda. He states that several pairs occur there; that the young have the upper parts grey all winter, and change to white in summer; that he has been at the nest of one; and that the old birds were so violent in their attacks that he had difficulty in keeping them off with a stick.

MUSCICAPA GRISOLA. SPOTTED GREY FLYCATCHER. Vol. III, p. 518.

The cry of alarm or anxiety of this species is *fee-chac-chac*, which it utters incessantly when apprehensive of danger to its nest. I have seen one watch a cat for a long time, flitting about with extreme restlessness, and all the while emitting its cry. This species does not merely pursue insects on wing, but also searches for them on the twigs. I have seen it bathe by fluttering on the leaves of a lime-tree after a heavy shower, and the sight was a peculiarly pleasing one, the act having been performed by numerous repetitions until the plumage was all draggled, when by fluttering and preening the bird began to dry itself in the sunshine. Mr Harley informs me that when the young can fly, and have just left the nest, they will sit all of a row upon a rail, or the uppermost bar of a gate, and wait for food from their parents. They receive it with joyous twitters, and a tremulous movement of the wings. Both parent birds feed their young.

CARDUELIS SPINUS. SISKIN. Vol. I, p. 400. Vol. III, p. 702.

I have the pleasure of presenting here a detailed account of the Siskin's nest, mentioned in p. 702, as having been found in Kincardineshire, by Mr William Mactier, an enthusiastic young ornithologist, who has favoured me with the following notice: "The nest which you got to-day I found on the 23d of April. My attention was first drawn to it by the cry of one of the old birds, which was hopping about in the neighbourhood. It was placed in a larch tree about thirty feet from the ground, and on the upper surface of a long projecting branch, near the point, and at the place where it separated into two twigs. The situation was not a very retired one, for it was within three hundred yards of the house, and overhung a road by which people occasionally passed. As there was great difficulty in

reaching the branch, I climbed a neighbouring tree, and with the assistance of a long stick drew the nest near enough to ascertain that it contained young. While I was thus employed, the hen bird expressed great anxiety, and even flew into the nest as I was drawing it towards me. The cock was much more shy, and kept at a safer distance. On my going up to it about a fortnight after, with a ladder, the birds all made their escape. The nest was therefore taken down. It was an inch or so thicker on the side next the point of the twig than on the opposite side, to make up for the dip of the branch. As you will see, it is composed chiefly of roots, moss, hair, and a downy substance, but has no feathers in its lining."

It may be described thus: It is regularly cup-shaped, four inches and a half in diameter externally at the mouth, and two inches and a quarter internally, its walls being about an inch and a quarter in thickness. Externally it is composed of hypna, kept together by hairs and delicate fibrous roots, the mouth strengthened by slender stalks of herbaceous plants and woody root-fibres. The inner layer, which is half an inch thick, is composed chiefly of pappus, or seed-down, of two kinds, some being simple, others plumose, densely felted and held together by numerous hairs. Externally of this inner layer are several downy feathers, and internally is a great number of strong horse hairs, most of them black, but some white, arranged in a circular manner. Intermixed with the pappus is a great quantity of fine whitish scales, which on being rubbed between the fingers have exactly the appearance and feeling of steatite, these scales being, I believe, the remains of the tubes in which the feathers of the young birds were enveloped. That the fibres are pappus, and not willow-down, is apparent, both from many of them being plumose, and from their attachment to the pericarps being still obvious.

OBSERVATIONS ON THE SONG OF BIRDS.

BY MR. ARCHIBALD HEPBURN.

The following Table is the result of two years' observation on the Song of our Birds. Two or three species are omitted, and to others I am unable to fix the periods at which they commence and cease singing. These periods of course, like the migrations of birds, vary according to the weather. On comparing these notes with some papers in White's Selborne, I was much surprised at the difference which they exhibit.

1. Cinclus europæus. Sings all the year.
2. Turdus viscivorus. Begins to sing third week of January. Sings occasionally at all seasons.
3. Turdus musicus. Begins fourth week of January: ceases second week of July. Sings occasionally in autumn and winter.
4. Turdus Merula. Begins fourth week of January: ceases second week of July. Sings occasionally in autumn and winter.
5. Turdus torquatus. Begins third week of April.
6. Alauda arvensis. Begins fourth week of January: ceases third week of July. Sings again in September and October.
7. Anthus pratensis. Begins third week of April: ceases third week of July.
8. Anthus arboreus. Begins second week of May.
9. Anthus aquaticus. Begins in April.
10. Motacilla Yarrelli. Sings during its stay in East Lothian.
11. Accentor modularis. Begins second week of February: ceases first week of August. Sings occasionally in autumn and winter.
12. Erithacus Rubecula. Sings all the year.
13. Fruticicola Rubetra. Begins third week of April.

14. Fruticicola Rubicola. Begins first week of April: ceases third week of June.
15. Saxicola Œnanthe. Begins second week of April.
16. Ruticilla Phœnicurus. Begins fourth week of April.
17. Sylvia atricapilla. Begins second week of May: ceases third week of July.
18. Sylvia hortensis. Begins second week of May: ceases third week of July.
19. Sylvia cinerea. Begins fourth week of April: ceases third week of July. Sings occasionally in August and September.
20. Sylvia garrula. Begins second week of May.
21. Phyllopneuste sylvicola. Begins first week of May. Sings till its departure.
22. Phyllopneuste Trochilus. Begins fourth week of April. Sings till its departure.
23. Calamoherpe phragmitis. Begins first week of May: ceases first week of July.
24. Regulus auricapillus. Begins third week of February: ceases third week of July. Sings occasionally at all seasons.
25. Columba Palumbus. Begins first week of February: ceases first week of October.
26. Fringilla cœlebs. Begins fourth week of January: ceases second week of July. Sings again in autumn, and even winter.
27. Linaria Chloris. Begins second week of March: ceases first week of August.
28. Linaria cannabina. Sings at all seasons.
29. Carduelis elegans. Begins second week of April: ceases in September.
30. Emberiza miliaria. Begins second week of January: ceases second week of August. Sings occasionally in winter.
31. Emberiza Citrinella. Begins second week of February: ceases third week of August. Sings occasionally in autumn and winter.
32. Emberiza Schœniclus. Begins second week of April.

33. Hirundo rustica. Begins fourth week of April.
34. Troglodytes europæus. Begins in February: ceases third week of November. Rarely heard in winter.
35. Cuculus canorus. Begins first week of May: ceases first week of July.

The season of love certainly exerts a most powerful influence as to the song of birds; but to what influence should we ascribe those songs which we hear in autumn and winter? Are they owing to the abundance of food and occasional warmth of the air? These no doubt exert a certain influence; but then why did the Chaffinch sing so frequently in the winter of 1839-40, while during the same season of the previous years its voice was never heard? In this case, neither the weather nor the scarcity of food could have any influence; and why, may I ask, are not all our choristers heard during the delightful days which we sometimes enjoy in winter? Granivorous birds can never want food in the stackyards of the Lothians. I am now almost persuaded that all the facts which can ever be accumulated, will never explain this great mystery.

In the course of my rambles in my native country, I have endeavoured to ascertain at what time our warblers commence their matin lays. In the beginning of July, at about half-past one o'clock, up springs the Sky Lark, to greet the coming morn; at two the Swallow twitters from his "straw-built shed;" soon the mellow-toned Blackbird and the thrilling Thrush call up the grove; the Robin Redbreast takes up the burden of the song, and the Wren, as he bustles from his ivy roost, joins the strain. Now the Blackcap is heard loud and clear; let the enraptured ear dwell for three or four minutes on the charming and ever-varied song of the Garden Warbler, rising and falling in the softest and sweetest swells and cadences. Advancing along the woodland path, we listen to the melody of the Green Woodwren, the curious song of the Yellow Woodwren, high up in the beechen tree the notes of the White-throat Warbler, in some individuals musical, in others harsh, and of many other songsters, which mingle with the call of the Cuckoo, and the murmur of the Cushat.

But would the field ornithologist investigate the songs of particular birds, the evening is the best time, for as twilight advances, they one by one drop into silence, and the excellencies of each may be duly appreciated. Truly, the most unalloyed pleasures of rural life are known but to a few.

And now I think I have brought my labours to a close, for a time at least, and truly they have been labours of love, both as regards the kind friend whom I so highly esteem, and the science to which we are so devotedly attached. In other years, in a foreign land, far from the groves of my forefathers, dear will be the remembrance of the days which I spent in examining the habits of the birds of East Lothian.

ARCHIBALD HEPBURN.

WHITTINGHAM, *9th May* 1840.

PICUS PIPRA. GREATER SPOTTED WOODPECKER.

Vol. III, p. 80.

Dr Robertson of Dunkeld has sent me a specimen of this Woodpecker, shot in the Duke of Atholl's grounds. He states that some years ago the species was not very uncommon in the woods there, but that of late it has entirely disappeared, the individual sent being the last that has been seen.

CORVUS LEUCOPHÆUS. THE PIED RAVEN.

WHITE RAVEN. FERROE RAVEN.

Corvus borealis albus. Briss. Ornith. VI. Suppl. 33. Pl. II. Fig. 1.
Corvus leucophæus. Vieill. Gal. des Ois. I. Pl. c.
Corbeau leucophée. Corvus leucophæus. Temm. Man. d'Orn. III. 56.

Bill and feet dusky, claws and tips of mandibles white. Head, throat, breast, abdomen, the greater part of the wings, some of the lower tail-coverts, and part of the middle tail-feathers, white; hind-neck, back, scapulars, some of the wing-coverts and secondaries, upper tail-coverts, most of the tail-feathers, and some of the elongated feathers on the fore-neck, black.

In the first volume of this work, at p. 501, it is stated that I saw in Harris a Raven that was patched with white. It frequented for several weeks the Hill of Northtown, did not associate with other birds, and seemed a neglected or persecuted stranger. This bird I had always considered as a pied variety of the common Raven, until the 12th of May 1840, when I was presented by Dr Lawrence Edmondston, of Balta Sound, Shetland, with a specimen of the Pied Raven of Ferroe, when I at once saw that the Hebridian bird was the same. I therefore introduce it here, being pretty well convinced that the Ferroe Raven is a distinct species. The specimen alluded to may be thus described.

The form and dimensions are those of the Common Raven, in so far as can be judged from a prepared skin, of which the tips of the primaries are cut, and the tail-feathers partially damaged. The bill, however, is much larger, being not only higher at the base, but more elongated, and in form more attenuated at the end, so as in this respect to resemble in some degree that of the Rook. It is of a greyish-black colour, with the tip of each mandible and a small portion of the ridge of

the upper white. The feet are black, some of the scutella with whitish margins, and the claws are white. The head is white, but with several black feathers irregularly interspersed. The reversed bristly feathers at the base of the bill are also white. The hind part of the neck, the whole of the back, the scapulars, and some of the wing-coverts, as well as the tail-coverts, are greyish-black, glossed with blue. The tail-feathers are dull black, except the basal half of the middle four, which is brownish-white, and the shafts of all, which are white at the base, and light brown toward the end. The primary quills, their coverts, the alula, many of the smaller coverts, most of the secondary coverts, and the outer secondary quills, white. In the left wing, only two secondaries, but in the right seven, are black; the outer primary of the right wing is nearly all brown, and two of the other primaries are tinged with that colour. The throat and sides of the neck are white; at the lower part of the neck and fore part of the breast, is a patch of glossy black, including a great part of the elongated lanceolate feathers. The breast and abdomen are white, with some black feathers on the sides. The smaller lower wing-coverts black, the larger white; the tibial feathers black, as are those under the tail, excepting some in the middle part. The downy part of all the black feathers is light grey.

Length to end of tail about 25 inches; bill along the ridge $3\frac{4}{12}$; its height at the base $1\frac{4}{12}$; edge of lower mandible 3; tarsus $2\frac{3}{4}$; hind toe 1, its claw $1\frac{4}{12}$; third toe 2, its claw $1\frac{2}{12}$.

M. Temminck's description agrees with this, the differences being slight. The individual described by Brisson corresponds in all respects with the above, only more of the tail-feathers are white, and there are some differences in the quills. This figure so nearly represents my specimen, that it might well pass as having been taken from it. As all the specimens hitherto described are similar, with slight differences, it seems not improbable that the Ferroe Raven is a distinct species. The question, however, can be decided only by a good observer, who, visiting its native country, shall investigate its habits, and describe it from numerous specimens.

EXPLANATION OF THE PLATES.

PLATE XIV. Digestive Organs of Creepers and Woodpeckers. *Natural size.* The same letters refer to the same parts in all.

FIG. 1. *Digestive Organs of the Wren, Anorthura Troglodytes.*

a, *b*, *c*, the œsophagus.
b, *c*, proventriculus.
d, stomach.
d, *e*, *f*, duodenum.
g, *j*, rest of intestine.
h, cœca.
i, *j*, cloacal dilatation of the rectum.

FIG. 2. *Digestive Organs of the Creeper, Certhia familiaris.*

FIG. 3. *Digestive Organs of the Nuthatch, Sitta europæa.*

The stomach remarkably large.

FIG. 4. *Digestive Organs of the Pied Woodpecker, Picus Pipra.*

The œsophagus extremely dilated in its proventricular portion, *b*, *c*; the stomach rather small, but muscular; the intestine wide; no cœca; the cloaca extremely large.

FIG. 5. *Digestive Organs of the Green Woodpecker, Picus viridis.*

The same circumstances as in the Pied Woodpecker; the stomach still smaller.

PLATE XV. Tongue and Trachea of the Green Woodpecker Picus viridis. *Natural size.*

FIG. 1, 2. *Diagrams illustrative of an Extensile Tongue.*

FIG. 3. *Lateral View of the Head and Neck, shewing the Tongue, Hyoid Bones, Salivary Glands, Trachea and its Muscles.*

a, *b*, mandibles.
c, *d*, *e*, tongue.
f, *g*, hyoid bone and its muscle.
h, orbit.
i, *i*, salivary glands.
j, neck.
k, *k*, œsophagus.
l, *l*, trachea.
m, *m*, lateral muscles of trachea.
n, *n*, *o*, cleido-tracheal muscles.

FIG. 4. *Head of the Green Woodpecker, viewed from below.*

b, lower mandible.
i, *i*, salivary glands.
f, *g*, hyoid bones and muscles.

k, *k*, œsophagus.
l, *l*, trachea.
m, *m*, its lateral muscles.
n, *n*, cleido-tracheal muscles.
p, *p*, glosso-pharyngeal muscles, twisted round the trachea.
q, *q*, muscles which thrust out the tongue.

FIG. 5. *Head of the Green Woodpecker, seen from above, shewing,*

a, *a*, the hyoid bones and their muscles, attached to the upper jaw, near the right nostril, *b*.

PLATE XVI. Digestive Organs of the Grey Cuckoo, Cuculus canorus. *Reduced.*

FIG. 1. *Digestive Organs.*

a, tongue.
b, *c*, œsophagus.
c, *d*, proventriculus.
e, *f*, stomach.
g, one of its tendons.
c, *h*, *i*, *j*, *k*, intestine.

FIG. 2. *Proventriculus and Stomach laid open.*

a, *b*, belt of proventricular glands.
b, *c*, *d*, inner membrane of stomach.

FIG. 3. *Another Stomach laid open, shewing the hairs thrust into its epithelium.*

FIG. 4. *Rectum and Cœca.*

a, *d*, intestine.
c, *d*, cœca, unequal in size.

FIG. 5. *Tongues of four Individuals.*

a, acute.
b, slightly emarginate.
c, emarginate.
d, obtuse and bristled.

FIG. 6. *Ovary and Oviduct.*

a, eggs in progress.
b, oviduct.
c, rectum.

FIG. 7. *Inner Surface of Oviduct.*

FIG. 8. *Cœca of another Individual.*

PLATE XVII. Head, Mouth, and Eye of the Brown Buzzard, Buteo fuscus. *Natural size.*

FIG. 1. *Head.*

a, upper mandible.
b, lower mandible.
c, tongue.
d, palate.

FIG. 2. *Lower Eyelid everted.*

FIG. 3. *Eye and Nictitant Membrane.*

a, lower eyelid turned down.
b, posterior bony edge of orbit.
c, eye-ball.
d, cornea.
e, *f*, *g*, nictitant membrane, drawn partly over the eye.

FIG. 4. *Nictitant Membrane folded up.*

FIG. 5. *Anterior View of the Eye-ball.*

FIG. 6. *Posterior View of the Eye-ball.*

a, pyramidal muscle, of which the tendon is attached to the nictitant membrane.
b, quadratus muscle.
c, rectus superior.
d, rectus inferior.
e, rectus posticus.
f, rectus anticus.
g, obliquus superior.
h, obliquus inferior.

FIG. 7. *Lateral View of the Eye-ball.*

a, *a*, *a*, posterior surface.
c, *c*, anterior part of sclerotica.
b, *b*, margin of sclerotica.
b, *b*, *b*, cornea, hemispherical.

FIG. 8. *Circle of Sclerotic Bones.*

a, inferior central bone.
c, superior central bone.

FIG. 9. *Section of the Eye.*

a, *a*, sclerotic coat.
b, *b*, choroid coat and pigmentum.
c, ciliary circle.
d, lens.
e, *e*, iris.
f, cornea.
g, optic nerve.
h, pecten.

FIG. 10. *The Lens.*

a, viewed laterally.
b, seen from before.

PLATE XVIII. Brain, Nasal Cavity, and Organ of Hearing in the Brown Buzzard, Buteo vulgaris. Ear of Falcon. *Natural size.*

FIG. 1. *Section of the Head of a Buzzard.*

a, *b*, *c*, *d*, section of skull.
a, *b*, cerebellum.
b, *e*, cerebrum.
e, optic lobe.
f, *g*, pharynx.
h, tongue.
i, *j*, entrance of nasal passage.
j, *k*, median outline of palate.
l, nostril.
m, *n*, *o*, upper, middle, and lower turbinated bones.
p, *m*, olfactory nerve.
e, *m*, *k*, branch of fifth pair.

FIG. 2. *Skull of Buzzard, shewing the Internal Ear.*

a, *b*, external aperture of ear.
a, *b*, *c*, meatus externus, slit open.
d, tympanum.
e, muscle of lower jaw.
f, *g*, *h*, semicircular canal.
i, vestibule.

PLATE XIX. Respiratory Organs of Vultures, Hawks, and Owls. *Natural size.*

FIG. 1. *Lower part of the Trachea of the Turkey Buzzard, Cathartes Aura.*

a, *b*, trachea.
c, inferior larynx.
d, *e*, bronchi, membranous in a great part of their extent.
f, *g*, contractor muscles, ending in the sterno-tracheales.

FIG. 2. *Trachea of the Peregrine Falcon, Falco peregrinus, viewed from behind.*

a, tongue.
b, mucous crypts toward its base.
c, hyoid bones.
d, *e*, trachea.
f, *f*, last dimidiate tracheal rings.
g, *g*, first bronchial half-rings.
g, *h*, bronchi.
i, *j*, lateral muscles.
j, *k*, sterno-tracheal muscles.
j, *f*, inferior-laryngeal muscles.

FIG. 3. *Last entire Ring of the Trachea.*

FIG. 4. *Side View of lower part of Larynx and Bronchus, shewing the inferior Laryngeal Muscle.*

FIG. 5. *Section of Inferior Larynx.*

FIG. 6. *Front View of Inferior Larynx and Bronchi.*

FIG. 7. *Front View of Superior Larynx.*
a, *a*, glosso-pharyngeal muscles.
b, *b*, thyroid cartilage.
c, *c*, commencement of lateral muscles.

FIG. 8. *Posterior View of Upper Larynx.*
a, apertor glottidis.
b, constrictor glottidis.

FIG. 9. *Trachea of the Snowy Owl, Syrnia nyctea, viewed from before.*

a, tongue.
b, its basal part.
c, *c*, hyoid bones.
d, *e*, trachea.
f, *g*, dimidiate rings of trachea.
g, *h*, bronchi.
i, *j*, lateral muscles.
j, *k*, sterno-tracheal muscles.
j, *f*, inferior-laryngeal muscles.

PLATE XX. Digestive Organs of the White-tailed Sea-Eagle and Golden Eagle. *Reduced.*

FIG. 1. *Digestive Organs of the White-tailed Sea-Eagle, Haliaëtus Albicilla.*

a, tongue.
b, hyoid bones.
b, *c*, *d*, *e*, *f*, œsophagus.
c, *d*, its dilated part, or crop.
g, *h*, stomach, empty.
h, *i*, duodenum, singularly elongated and coiled.
h, *i*, *j*, *k*, *l*, intestine, extremely narrow and elongated.
k, *l*, cloaca.
m, cœca.

FIG. 2. *Digestive Organs of the Golden Eagle, Aquila Chrysaëtus.*

a, tongue.
b, hyoid bones.
b, *c*, *d*, *e*, *f*, œsophagus.
c, *d*, its dilated part, or crop.
g, *h*, stomach, full.
h, *i*, duodenum, bent in the usual manner.
h, *i*, *j*, *k*, *l*, intestine of moderate length and width.
k, *l*, cloaca.
m, cœca.

PLATE XXI. Digestive Organs of Hawks and Owls. *Reduced.*

FIG. 1. *Proventriculus, Stomach, and Intestine of the Osprey, Pandion Haliaëtus.*

a, b, c, proventriculus.
c, d, stomach.
d, e, f, g, h, i, k, intestine, extremely narrow, and elongated.
i, j, cloaca.
k, bursa Fabricii.
l, l, ureters.

FIG. 2. *Proventriculus, Stomach, and Intestine of the Kite, Milvus regalis.*

a, b, c, proventriculus.
c, d, stomach.
d, e, f, g, h, i, j, intestine.
i, j, cloaca.

FIG. 3. *Digestive Organs of the Hen Harrier, Circus cyaneus.*

a, b, c, d, œsophagus, the crop, *b c,* extremely large.
d, e, proventriculus.
e, stomach.
e, f, h, j, intestine, very short.
l, ureters.
k, bursa Fabricii.

FIG. 4. *Digestive Organs of the Great Eagle-Owl, Bubo maximus.*

a, b, c, œsophagus, destitute of dilatation, or crop.
d, e, f, duodenum.
d, e, f, g, j, intestine, rather short and narrow.

FIG. 5. *Cœca of Eagle-Owl.*

a, b, part of intestine.
c d, c d, cœca.

PLATE XXII. Digestive Organs of Shrikes, Flycatchers, Chatterers, Swallows, Swifts, Goatsuckers, and Kingfishers. *Half size.*

FIG. 1. *Digestive Organs of the Cinereous Shrike, Lanius Excubitor.*

a, tongue.
b, c, d, œsophagus.
d, e, stomach.
f, g, h, duodenum.
f, g, h, i, j, k, l, intestine.
j, cœca.
m, n, trachea.
o, o, bronchi.
p, p, sterno-tracheales.
c, inferior larynx.

FIG. 2. *Digestive Organs of the Grey Flycatcher, Muscicapa Grisola.*

a, tongue.
b, c, d, œsophagus.
e, f, g, h, intestine.
h, cœca.

FIG. 3. *Digestive Organs of the Waxwing, Bombycilla garrula.*

a, b, c, d, œsophagus, widely dilated from *b* to *c*.
d, stomach.
e, f, g, h, i, intestine, short and wide.
h, cœca.

FIG. 4. *Digestive Organs of the Chimney Swallow, Hirundo rustica.*

a, bill.
b, c, d, œsophagus.

d, *e*, stomach.
f, *g*, *h*, *i*, *j*, *k*, intestine.
j, cœca.

FIG. 5. *Digestive Organs of the Black Swift, Cypselus murarius.*

a, bill.
b, *c*, *d*, œsophagus.
c, *d*, proventriculus.
d, *e*, stomach.
f, *g*, *h*, *i*, *j*, *k*, intestine.
l, *l*, salivary crypts.
m, *n*, trachea.
o, *o*, bronchi.
p, *p*, sterno-tracheales.

FIG. 6. *Digestive Organs of the Goat-sucker, Caprimulgus europœus.*

a, tongue.
b, *c*, *d*, œsophagus.
d, *e*, stomach.
f, *g*, *h*, *i*, *j*, *l*, *m*, intestine.
k, *k*, cœca, resembling those of Owls.
l, *m*, cloaca.
n, *o*, trachea.
r, *r*, bronchi.
q, *q*, sterno-tracheales.

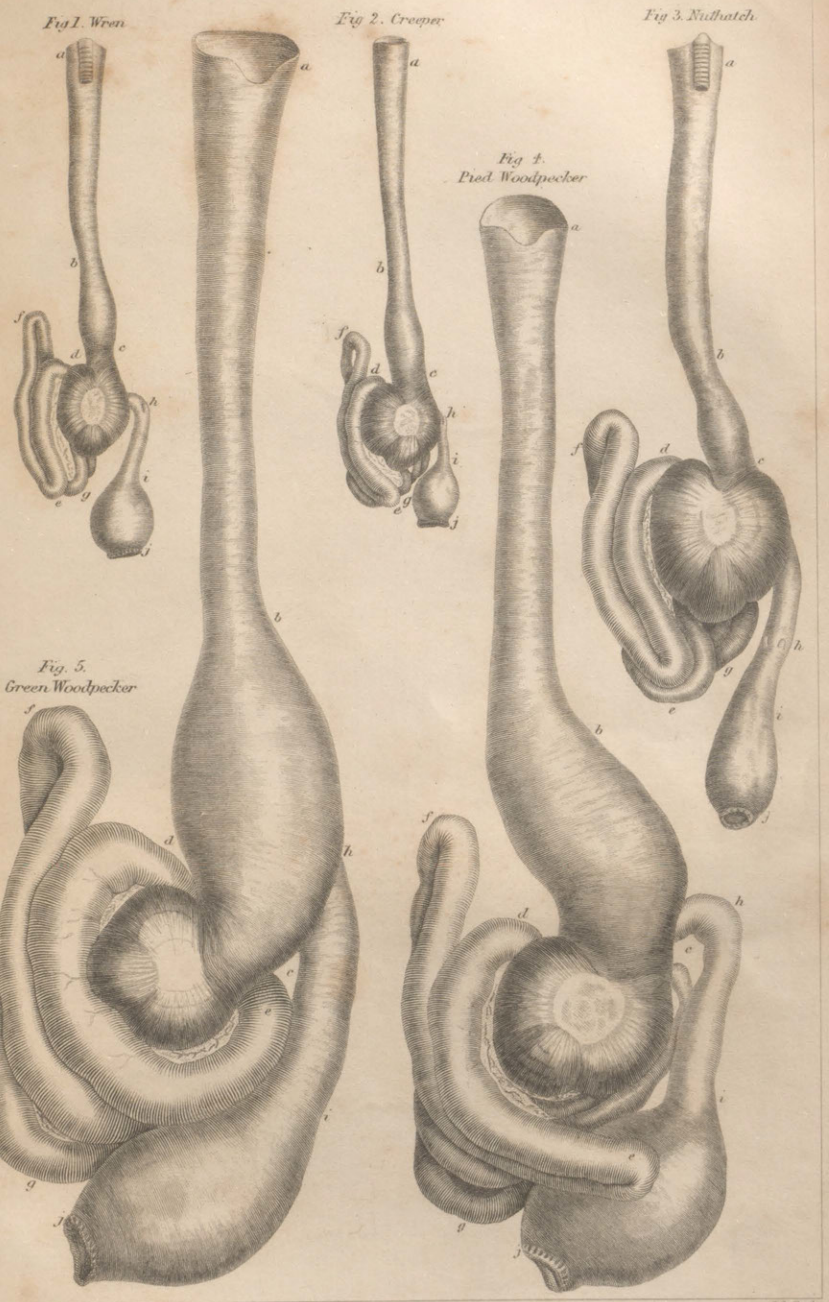
FIG. 7. *Digestive Organs of Kingfisher, Alcedo Ispida.*

a, tongue.
b, *c*, *d*, œsophagus.
d, *e*, *f*, stomach.
f, *g*, *h*, *i*, *j*, *k*, intestine, very narrow, without cœca.
j, *k*, cloaca.

Vol. I, p. 527, l. 15. For *their* fingers read *his* fingers.
Vol. II, p. 138, l. 13 and 14. Read, the young birds frequently stretched out their wings.

PLATE XIV

DIGESTIVE ORGANS OF CREEPERS AND WOODPECKERS.



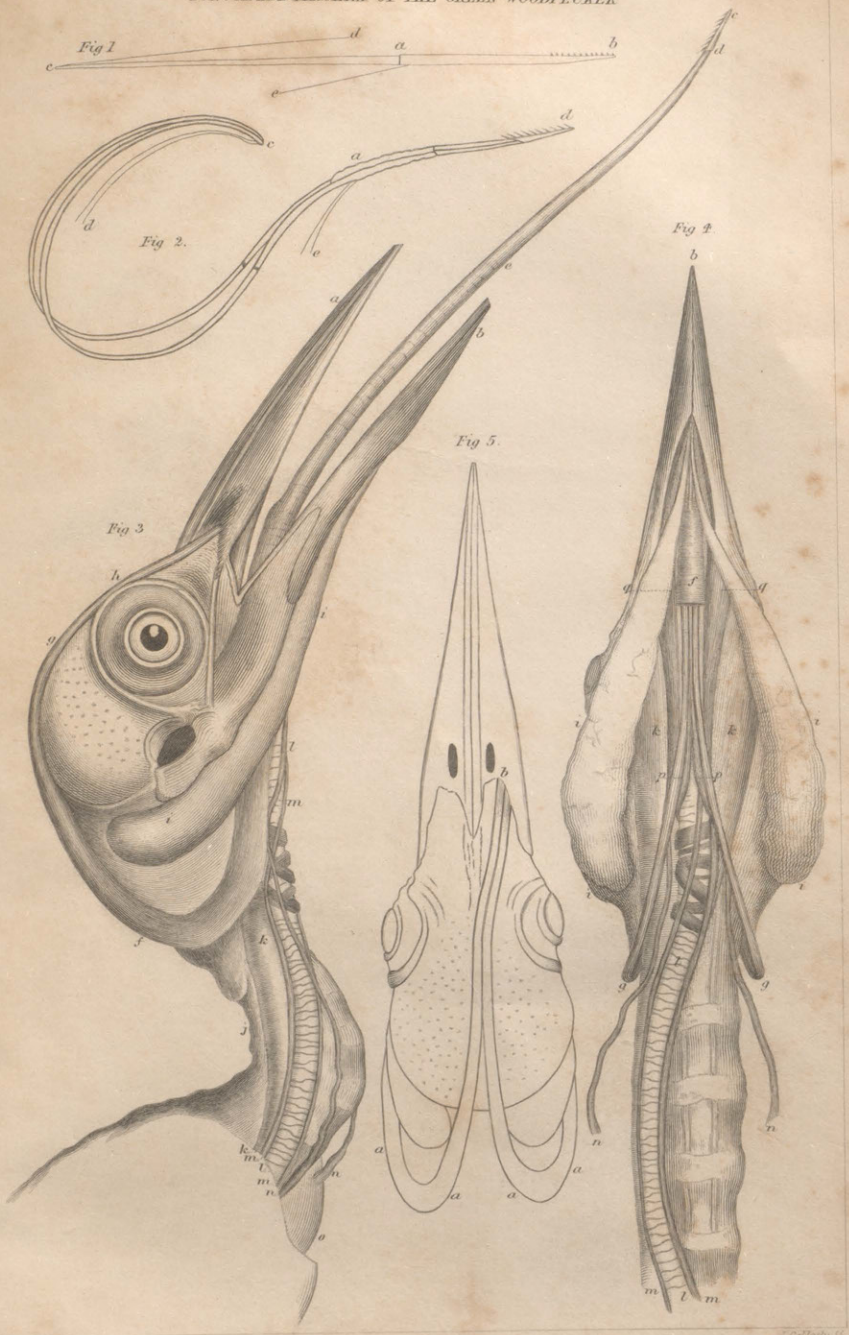
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PLATE XV.

TONGUE AND TRACHEA OF THE GREEN WOODPECKER



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PLATE XVI.

DIGESTIVE ORGANS OF THE CUCKOO, CUCULUS CANORUS.

Fig. 5.



Fig. 3.

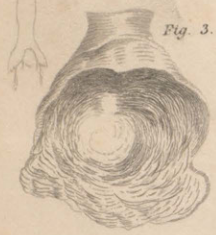


Fig. 6.



Fig. 1.



Fig. 2.



Fig. 8.



Fig. 4.



Fig. 7.



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PLATE XVII.

THE EYE, NOSTRILS, AND TONGUE.

Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.

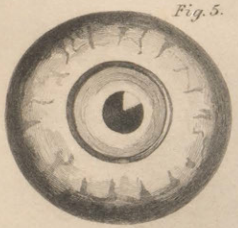


Fig. 6.

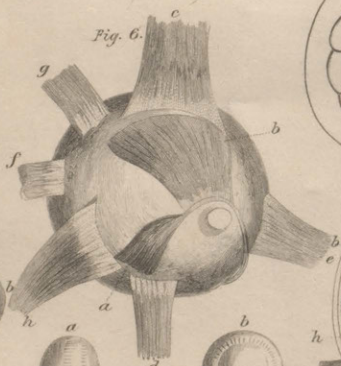


Fig. 8.

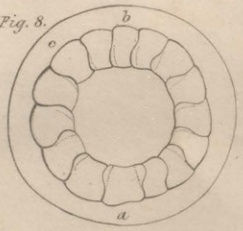


Fig. 7.

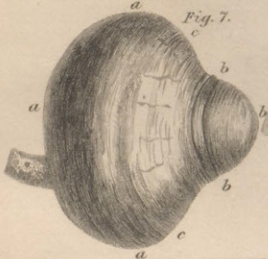


Fig. 9.

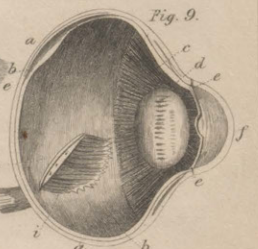


Fig. 10.



W. Mac Gillivray. J. Caldecott.

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PLATE XVIII.

BRAIN AND ORGANS OF SMELL AND HEARING.

Fig. 1.



Fig. 2.



Fig. 3.



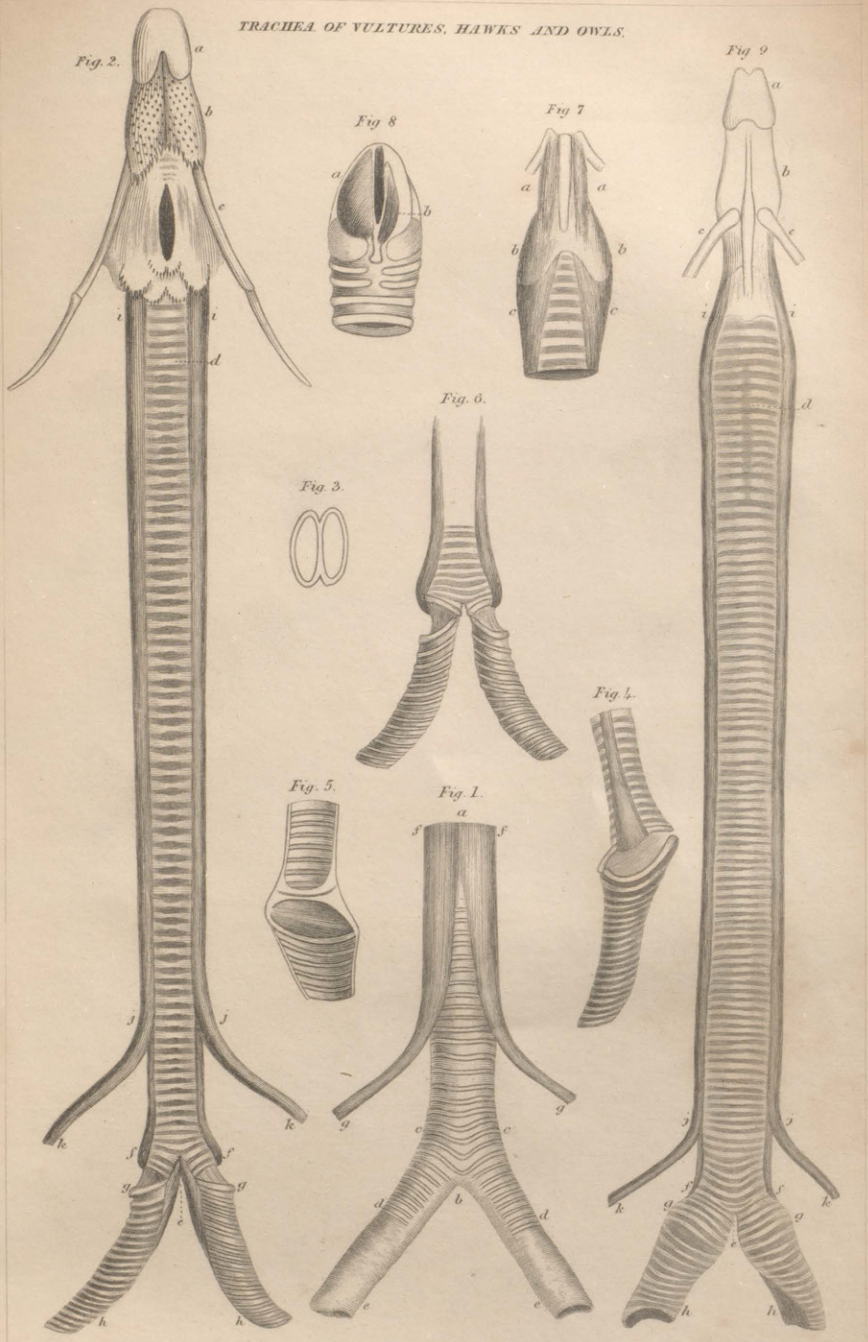
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PLATE XIX

TRACHEA OF VULTURES, HAWKS AND OWLS.



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PLATE XX

DIGESTIVE ORGANS OF THE SEA EAGLE AND GOLDEN EAGLE

Fig. 1.

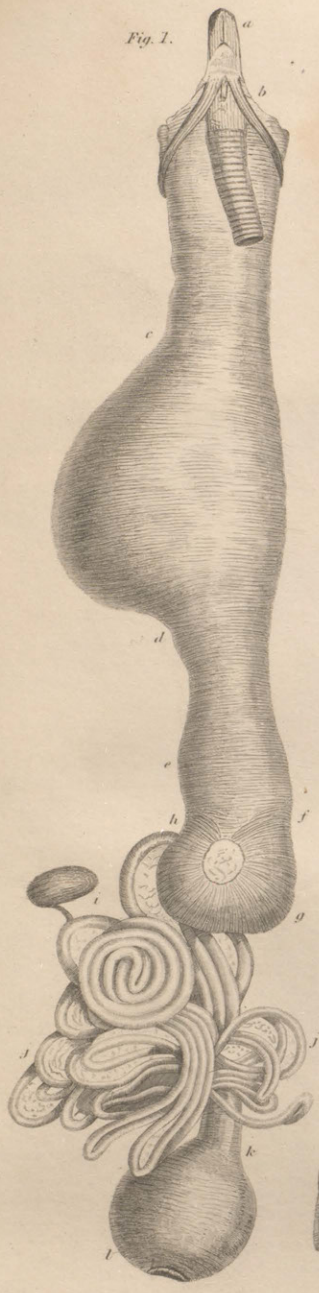
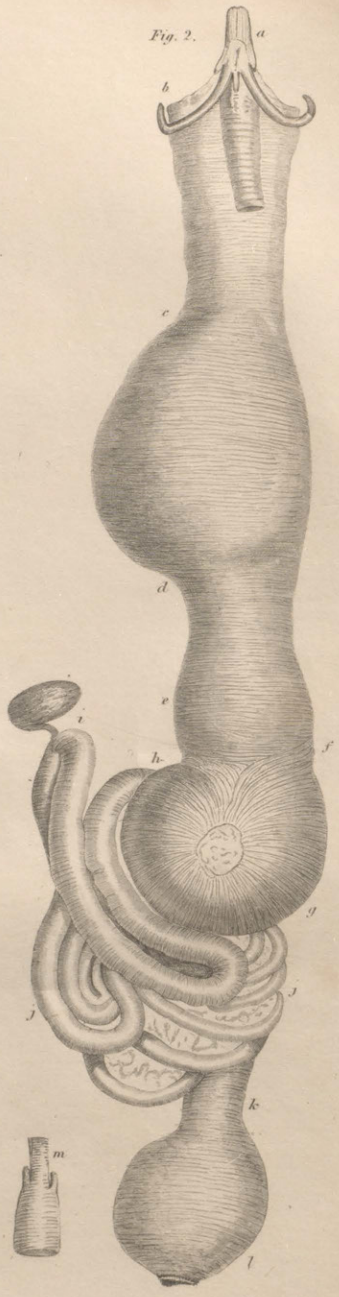


Fig. 2.

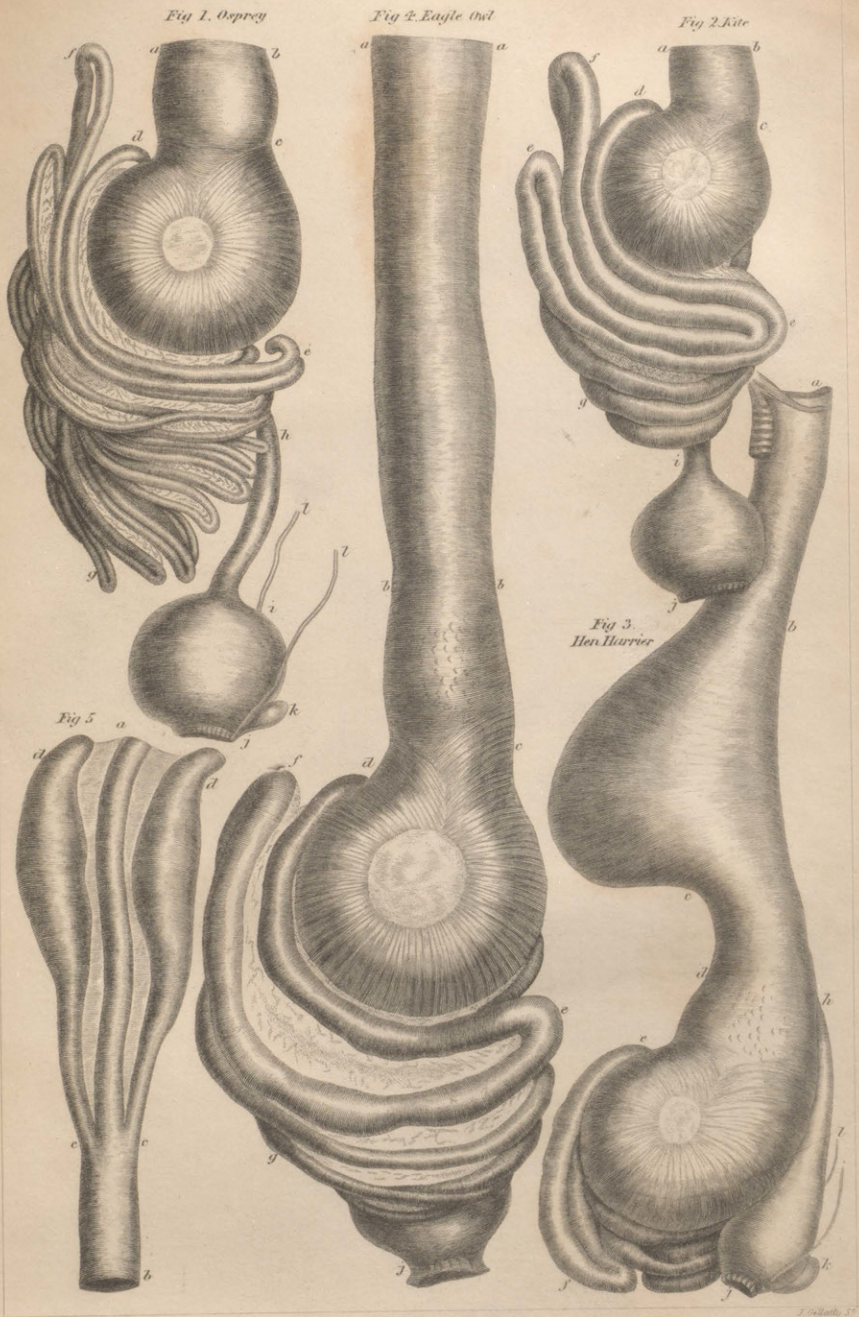


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PLATE XXI.

DIGESTIVE ORGANS OF HAWKS AND OWLS



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PLATE XXII.

DIGESTIVE ORGANS OF SHRIKES, FLYCATCHERS, CHATTERERS, SWALLOWS, SWIFTS, GOATSUCKERS, AND KINGFISHERS

Fig 1. Cinereous Shrike

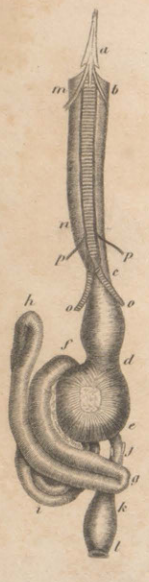


Fig 7. Kingfisher

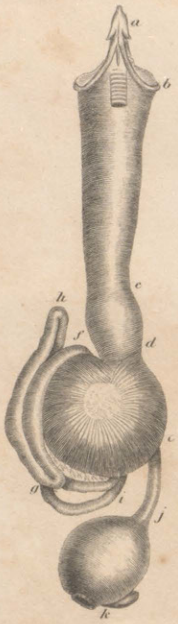


Fig 6. Goatsucker



Fig 3. Waxwing



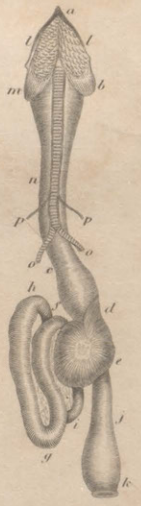
Fig 2. Grey Flycatcher



Fig 4. Swallow



Fig 5. Swift



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56. Sturnus guttatus. Spotted Starling. i, 595. . *Res.*
GEN. XXXIII. THREMMAPHILUS. COW-BIRD. i, 610.
57. Thremmaphilus roseus. Roseate Cow-bird. i, 613 ; iii, 723. *Str.*

FAMILY XIV. MYRMOTHERINÆ. ANTCATCHERS AND ALLIED SPECIES. ii, 45.

GEN. XXXIV. CINCLUS. DIPPER. ii, 48.
58. Cinclus europæus. European Dipper. ii, 50. . *Res.*

FAMILY XV. TURDINÆ. THRUSHES AND ALLIED SPECIES. ii, 66.

GEN. XXXV. ORIOLUS. ORIOLE. ii, 71.
59. Oriolus Galbula. Golden Oriole. ii, 73. . *Str.*
GEN. XXXVI. TURDUS. THRUSH. ii, 77.
60. Turdus Merula. Black Thrush, or Blackbird. ii, 81. . *Res.*
61. Turdus torquatus. White-breasted Thrush, or Ring Ouzel. ii, 100. . . . . *Im.*
62. Turdus pilaris. Chestnut-backed Thrush, or Fieldfare. ii, 105 ; iii, 725. . . . . *Im.*
63. Turdus viscivorus. Missel Thrush, or Shrite. ii, 114. *Res.*
64. Turdus musicus. Song Thrush, or Mavis. ii, 127. . *Res.*
65. Turdus Iliacus. Red-sided Thrush, or Redwing. ii, 141. *Im.*
66. Turdus varius. Variegated Thrush. ii, 146. . *Str.*

FAMILY XVII. ALAUDINÆ. LARKS & ALLIED SPECIES. ii, 150.

GEN. XXXVII. ALAUDA. LARK. ii, 155.
67. Alauda alpestris. Shore Lark. ii, 159. . . *Str.*
68. Alauda arvensis. Sky Lark. ii, 163. . . *Res.*
69. Alauda arborea. Wood Lark. ii, 174. . . *Res.*
GEN. XXXVIII. ANTHUS. PIPIT. ii, 178.
70. Anthus pratensis. Meadow Pipit. ii, 181. . . *Res.*
71. Anthus arboreus. Tree Pipit. ii, 188. . . *Em.*
72. Anthus aquaticus. Shore Pipit. ii, 194. . . *Res.*
73. Anthus Richardi. Richard's Pipit. ii, 199. . *Str.*

FAMILY XVII. MOTACILLINÆ. WAGTAILS AND ALLIED SPECIES. ii, 202.

GEN. XXXIX. BUDYTES. QUAKETAIL. ii, 204.

74. Budytes flava. Blue-headed Quaketail. ii, 208. . *Str.*
75. Budytes Rayi. Green-headed Quaketail. ii, 212. . *Em.*

GEN. XL. MOTACILLA. WAGTAIL. ii, 218.

76. Motacilla alba. Grey-and-White Wagtail. ii, 221. . *Str.*
77. Motacilla Yarrelli. Pied Wagtail. ii, 225. . *Res.*
78. Motacilla Boarula. Grey-and-Yellow Wagtail. ii, 235. *Res.*

FAMILY XVIII. SAXICOLINÆ. STONECHATS AND ALLIED SPECIES. ii, 244.

GEN. XLI. ACCENTOR. CHANTER. ii, 249.

79. Accentor modularis. Hedge Chanter. ii, 251. . *Res.*
80. Accentor alpinus. Alpine Chanter. ii, 258. . . *Str.*

GEN. XLII. ERITHACUS. REDBREAST. ii, 261.

81. Erithacus Rubecula. Robin Redbreast. ii, 263. . *Res.*

GEN. XLIII. FRUTICICOLA. BUSHCHAT. ii, 271.

82. Fruticicola Rubetra. Whin Bushchat. ii, 273. . *Em.*
83. Fruticiola Rubicola. Black-headed Bushchat. ii. 279. *Res.*

GEN. XLIV. SAXICOLA. STONECHAT. · ii, 285.

84. Saxicola Œnanthe. White-rumped Stonechat. ii, 289. . *Em.*

GEN. XLV. RUTICILLA. REDSTART. ii, 298.

85. Ruticilla Cyanecula. Blue-throated Redstart. ii, 300. *Str.*
86. Ruticilla Phœnicurus. White-fronted Redstart. ii, 305; iii, 726. . . . . . *Em.*
87. Ruticilla Tithys. Black-breasted Redstart. ii, 311. . *Str.*

FAMILY XIX. SYLVIANÆ. WARBLERS AND ALLIED SPECIES. ii, 313.

GEN. XLVI. PHILOMELA. NIGHTINGALE. ii, 319.

88. Philomela Luscinia. Brake Nightingale. ii, 321; iii, 727. *Em.*

GEN. XLVII. SYLVIA. WARBLER, ii, 337.

89. Sylvia atricapilla. Black-capped Warbler. ii, 399; iii, 727. *Em.*
90. Sylvia hortensis. Garden Warbler, or Pettychaps. ii, 345; iii, 729. . . . . *Em.*
91. Sylvia cinerea. White-throated Warbler, or Whitethroat. ii, 350. . . . . *Em.*
92. Sylvia garrula. White-breasted Warbler, or Babbler. ii, 357; iii, 729. . . . . *Em.*

GEN. XLVIII. PHYLLOPNEUSTE. WOODWREN. ii, 361.

93. Phyllopneuste sylvicola. Yellow Woodwren. ii, 364. *Em.*
94. Phyllopneuste Trochilus. Willow Woodwren. ii, 371. . *Em.*
95. Phyllopneuste Hippolais. Short-winged Woodwren, or Chiffchaff. ii, 379. . . . . *Em.*

GEN. XLIX. MELIZOPHILUS. FURZELING. ii, 382.
96. Melizophilus provincialis. Provence Furzeling. ii, 383. . *Res.*

GEN. L. CALAMOHERPE. REEDLING. ii, 388.
97. Calamoherpe phragmitis. Sedge Reedling. ii, 390 ; iii, 732. *Em.*
98. Calamoherpe arundinacea. Marsh Reedling. ii, 395 ; iii, 731. *Em.*

GEN. LI. SIBILATRIX. CHIRPER. ii, 397.
99. Sibilatrix Locustella. Grasshopper Chirper. ii, 399 ; iii, 733. *Em.*

GEN. LII. REGULUS. KINGLET. ii, 405.
100. Regulus auricapillus. Gold-crowned Kinglet. ii, 408. *Res.*
101. Regulus ignicapillus. Fire-crowned Kinglet. ii, 416. *Str.*

FAMILY XX. PARINÆ. TITS AND ALLIED SPECIES. ii, 418.

GEN. LIII. PARUS. TIT. ii, 422.
102. Parus Fringillago. Ox-eye Tit. ii, 426. . . *Res.*
103. Parus cœruleus. Blue Tit. ii, 431. . . . *Res.*
104. Parus ater. Coal Tit. ii, 440. . . . *Res.*
105. Parus Palustris. Marsh Tit. ii, 445. . . . *Res.*
106. Parus cristatus. Crested Tit. ii, 450. . . *Res.*

GEN. LIV. MECISTURA. MUFFLIN. ii, 453.
107. Mecistura longicaudata. Long-tailed Mufflin. ii, 454. *Res.*

FAMILY XXI. CERTHIANÆ. TREE-CREEPERS AND ALLIED SPECIES. iii, 12.

GEN. LV. CERTHIA. TREE-CREEPER. iii, 31.
108. Certhia familiaris. Brown Tree-creeper. iii, 33. . *Res.*

GEN. LVI. ANORTHURA. WREN. iii, 13.
109. Anorthura Troglodytes. European Wren. iii, 15 ; iii, 734. *Res.*

GEN. LVII. UPUPA. HOOPOE. iii, 40.
110. Upupa Epops. European Hoopoe. iii, 41. . *Str.*

FAMILY XXII. SITTINÆ. NUTHATCHES AND ALLIED SPECIES. iii, 45.

GEN. LVIII. SITTA. NUTHATCH. iii, 46.
111. Sitta europæa. European Nuthatch. iii, 48. . . *Res.*

FAMILY XXIII. PICINÆ. WOODPECKERS & ALLIED SPECIES. iii, 69.

GEN. LIX. PICUS. WOODPECKER. iii, 73.
112. Picus martius. Great Black Woodpecker. iii, 77. . *Str.*
113. Picus Pipra. Pied Woodpecker. iii, 80. . . *Res.*
114. Picus striolatus. Striated Woodpecker. iii, 86. . *Res.*
115. Picus viridis. Green Woodpecker. iii, 91. . *Res.*

GEN. LX. YUNX. WRYNECK. iii, 98.
116. Yunx Torquilla. Wryneck. iii, 110. . . *Em.*

FAMILY XXIV. CUCULINÆ. CUCKOOS AND ALLIED SPECIES. iii, 105.

GEN. LXI. CUCULUS. CUCKOO. iii, 108.

117. Cuculus canorus. Grey Cuckoo. iii, 109. . *Em.*

GEN. LXII. COCCYZUS. COWCOW. iii, 136.

118. Coccyzus americanus. Yellow-billed Cowcow. iii, 137. *Str.*

FAMILY XXV. EMBERIZANÆ. BUNTINGS AND ALLIED GENERA. i, 433.

GEN. LXIII. EMBERIZA. BUNTING. i, 438.

119. Emberiza Miliaria. Corn Bunting. i, 440. . *Res.*

120. Emberiza Citrinella. Yellow Bunting. i, 445. . *Res.*

121. Emberiza Cirlus. Cirl Bunting. i, 450. . . *Res.*

122. Emberiza Schœniclus. Reed Bunting. i, 453; iii, 711. *Res.*

123. Emberiza hortulana. Ortolan Bunting. i, 457. . *Str.*

GEN. LXIV. PLECTROPHANES. LARK-BUNTING. i, 458.

124. Plectrophanes nivalis. Snow Lark-Bunting. i, 460. *Im.*

125. Plectrophanes lapponica. Lapland Lark-Bunting. i, 469. *Str.*

FAMILY XXVI. PASSERINÆ. SPARROWS AND ALLIED SPECIES. i, 319.

GEN. LXV. FRINGILLA. FINCH. i, 327.

126. Fringilla cœlebs. Chaffinch. i, 329. . . *Res.*

127. Fringilla Montifringilla. Mountain Finch, or Brambling. i, 335. . . . . *Im.*

GEN. LXVI. COCCOTHRAUSTES. GROSBEAK. i, 353.

128. Coccothraustes atrogularis. Black-throated Grosbeak or Haw-finch. i, 356. . . . *Res. and Str.*

GEN. LXVII. PASSER. SPARROW. i, 338.

129. Passer domesticus. House Sparrow. i, 340. . *Res.*

130. Passer montanus. Tree Sparrow. i, 351. . . *Res.*

GEN. LXVIII. LINARIA. LINNET. i, 363.

131. Linaria Chloris. Green Linnet. i, 366. . . *Res.*

132. Linaria cannabina. Brown Linnet. i, 371. . *Res.*

133. Linaria flavirostris. Mountain Linnet, or Twite. i, 379. *Res.*

134. Linaria minor. Smaller Redpoll Linnet. i, 383. . *Res.*

135. Linaria borealis. Mealy Redpoll Linnet. i, 388. . *Str.*

GEN. LXIX. CARDUELIS. THISTLEFINCH. i, 391.

136. Carduelis Spinus. Black-headed Thistlefinch, or Siskin. i, 400; iii, 702, 739. . . . . *Res.*

137. Carduelis elegans. Red-fronted Thistle-finch, or Goldfinch. i, 393. . . . . *Res.*

GEN. LXX. CALAMOPHILUS. PINNOCK. iii, 693.

138. Calamophilus biarmicus. Bearded Pinnock. iii, 694. . *Res.*

GEN. LXXI. PYRRHULA. BULLFINCH. i, 405.
139. Pyrrhula pileata. Coalhood Bullfinch. i, 407. . *Res.*
GEN. LXXII. CORYTHUS. PINEFINCH. i, 409.
140. Corythus Enucleator. Red Pinefinch. i, 411; iii, 703. *Im.*
GEN. LXXIII. LOXIA. CROSSBILL. i, 414.
141. Loxia europæa. European Crossbill. i. 417; iii. 704. *Res. and Im.*
142. Loxia pytiopsittacus. Parrot Crossbill. i, 429. . *Str.*
143. Loxia leucoptera. White-winged Crossbill. iii, 689. *Str.*

FAMILY XXVI. COLUMBINÆ. PIGEONS. i, 249.
GEN. LXXIV. COLUMBA. DOVE. i, 255.
144. Columba Palumbus. Ringed Dove. i, 259, iii, 699. *Res.*
145. Columba Livia. Rock Dove. i, 268. . . *Res.*
146. Columba Œnas. Blue-backed Dove. i, 287. . *Res.*
147. Columba Turtur. i. 291; iii, 701. . . *Em.*

FAMILY XXVII. PHASIANINÆ. PHEASANTS AND ALLIED SPECIES. i, 109.
GEN. LXXV. PHASIANUS. PHEASANT. i, 109.
148. Phasianus colchicus. Colchian Pheasant. i, 144. . *Res.*

FAMILY XXVIII. PERDICINÆ. PARTRIDGES AND ALLIED SPECIES. i, 127.
GEN. LXXVI. PERDIX. PARTRIDGE. i, 211.
149. Perdix Rubra. Red Partridge. i, 215. . *Res.*
150. Perdix cinerea. Grey Partridge. i, 218. . . *Res.*
GEN. LXXVII. ORTYX. COLIN. i, 226.
151. Ortyx virginiana. Virginian Colin. i, 288. . *Res.*
GEN. LXXVIII. COTURNIX. QUAIL. i, 231.
152. Coturnix dactylisonans. Wandering Quail. i, 233; iii, 699. *Em.*

FAMILY XXIX. TETRAONINÆ. GROUSE AND ALLIED SPECIES. i. 131.
GEN. LXXIX. TETRAO. GROUSE. i, 134.
153. Tetrao Tetrix. Lyre-tailed or Black Grouse. i, 145. *Res.*
GEN. LXXX. LAGOPUS. PTARMIGAN. i, 165.
154. Lagopus scoticus. Brown Ptarmigan. i, 169. . *Res.*
155. Lagopus cinereus. Grey Ptarmigan. i, 187. . *Res.*

END OF VOLUME THIRD.

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